

THE ANNALS
AND
MAGAZINE OF NATURAL HISTORY,

INCLUDING
ZOOLOGY, BOTANY, AND GEOLOGY.

(BEING A CONTINUATION OF THE 'ANNALS' COMBINED WITH LONDON AND
CHARLESWORTH'S 'MAGAZINE OF NATURAL HISTORY.')

CONDUCTED BY
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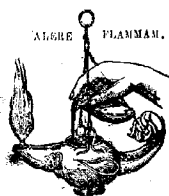
1917.

"Omnes res creatæ sunt divine sapientiæ et potentiæ testes, divitiarum felicitatis humanae:—ex harum usu *bonitas* Creatoris; ex pulchritudine *sapientia* Domini; ex oeconomia in conservatione, proportionè, renovatione, *potentia* majestatis elucet. Earum itaque indagatio ab hominibus sibi reflectis semper æstimata; à verè eruditis et sapientibus semper exulta; malò doctis et barbaris semper inimica fuit."—LINNÆUS.

"Quel que soit le principe de la vie animale, il ne faut qu'ouvrir les yeux pour voir qu'elle est le chef-d'œuvre de la Toute-puissance, et le but auquel se rapportent toutes ses opérations."—BAUCKNER, *Théorie du Système Animal*, Leyden, 1767.

..... The syrian powers
Obey our summons; from their deepest dells
The Dryads come, and throw their garlands wild
And odorous branches at our feet; the Nymphs
That press with nimble step the mountain-thyme
And purple heath-flower come not empty-handed,
But scatter round ten thousand ~~flowers~~ minute
Of velvet moss or lichen, torn from rock
Or rifted oak or cavern deep: the Naiads too
Quit their loved native stream, from whose smooth face
They crop the lily, and each sedge and rush
That drinks the rippling tide: the frozen poles,
Where peril waits the bold adventurer's tread,
The burning sands of Borneo and Cayenne,
All, all to us unlock their secret stores
And pay their cheerful tribute.

J. TAYLOR, *Norwich*, 1818.



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ERRATUM.

Page 330, line 14, for 1913. *Talitriator*, Matthews, P. Z. S. Lond. p. 109,
read *Talitriator*, Methuen, P. Z. S. Lond. p. 109.

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[EIGHTH SERIES.]

"..... per litora spargite muscum,
 Naiades, et circum vitreos considite fontes;
 Pollice virgineo teneros hic carpite flores:
 Floribus et pictum, divæ, replete canistrum.
 At vos, o Nymphæ Craterides, ite sub undas;
 Itæ, recurvato variata corallia trunco
 Vellite muscosâ e rupibus, et mihi conchas
 Ferte, Dææ pelagi, et pingui conchylia sacis."
N. Pertheus Giannattasi, Eol. 1.

No. 109. JANUARY 1917.

I.—Corylophidæ [Coleoptera] from the Seychelles and Rangoon. By HUGH SCOTT, M.A., F.L.S., Curator in Entomology in the University of Cambridge.

[Plates I-V.]

THE main purpose of this paper is to give an account of the Corylophid beetles obtained by the Percy Sladen Trust Expedition of 1905 and 1908-9 in the Seychelles and other islands of the Western Indian Ocean. But I have also included certain forms taken at Rangoon in 1911. The actual sources of these two sets of material may be considered separately, as follows:—

(A) RANGOON.—The specimens were collected from a nest of *Munia striata*, a bird belonging to the Ploceidæ or weaver-birds, on Oct. 9th, 1911, by Dr. H. H. Marshall, M.O.H., and sent by him in alcohol to Professor G. H. F. Nuttall at the Quick Laboratory, Cambridge. Professor Nuttall kindly handed over the Coleoptera to me. They consist of three species of Corylophidæ—namely, *Arthrolips flavicollis*, Matthews, *Orthoperus munia*, sp. n., and *Orthoperus* sp. det., as well as a single example of an undetermined

1

Cucujid which seems closely allied to *Silvanus longicornis*, Grönvelle, a form known from Singapore. In addition to Coleoptera, the tube contained some Lepidopterous larvæ, a spider (*Scytodes* sp.), and some Gammasid mites, all from the same bird's-nest. I do not know of other recorded cases of Corylophidae being found in birds'-nests, but I have myself taken a specimen of *Orthoperus* from a blackbird's or thrush's nest of the preceding year at Henley-on-Thames, 25. iii. 1910.

(B) SEYCHELLES ISLANDS.—It was intended that all results of the Percy Sladen Trust Expedition should appear together in one publication, but circumstances have rendered this impossible. The work in question consists of certain special volumes of Trans. Linn. Soc. London, five of which are already complete (ser. 2, Zool., vols. xii.-xvi.), while a sixth is in progress: these contain, *inter alia*, a number of reports on insects. In the present paper much the same plan is followed as in my two previous articles on certain groups of Seychelles Coleoptera (*op. cit.* vol. xv. p. 215, 1912; vol. xvi. p. 193, 1913).

No Corylophidae have been recorded from these islands before. Those dealt with here amount to twelve species, ten of which are described as new (see below, under "*determination of species*"), while one is undetermined and one is referred to a previously described species. They belong to eight genera, one of which is described as new. The series may be briefly analyzed thus:—*Sacium*, 4 spp. n.; *Arthrolops*, 1 sp. n., 1 sp. indet.; *Meioderus*, 1 sp. n.; *Sericoderus* (*Anisomeristes*), 1 sp. n.; *Daubania*, g. n., 1 sp. n.; *Lewisium*, 1 sp. n.; *Rhyppobius*, 1 sp. n.; *Orthoperus*, 1 sp. (previously known).

Distribution.—One species, *Rhyppobius aquilinus*, was found only on a coralline island of the Amirantes Group. The other eleven were all taken by the writer in the mountainous granitic islands of the Seychelles proper. Six of these were found exclusively in the island of Silhouette, which was visited only during the drier months of August and September; one was only obtained in Long Island, a small cultivated islet near Mahé, in July, also one of the drier months; the remaining four, including the new genus *Daubania*, were taken in two or more of the larger islands, and in both the drier and wetter seasons.

Two species are represented by single specimens, two (*Sericoderus* and *Lewisium*) by big series of over 50 and of nearly 200 respectively, the remainder by series of from 3 to 15 examples. They were all preserved dry.

Seven kinds were obtained only at high elevations, in the

endemic forests; one (*Arthrolips insulæ-longæ*), as stated above, only on a cultivated islet. Of the remainder, *Daubania* (gen. nov.) occurred in the high forests and at more moderate elevations, while the two most abundant forms (*Sericoderus* and *Lewisium*) seemed generally distributed from the cultivated country up into the endemic woods at high altitudes.

Most of the material was collected somewhat promiscuously, by general sweeping and beating of vegetation, but in some cases I have exact records of the manner in which specimens were taken. Thus some of the *Sericoderus* and of the *Lewisium* were swept from long grass, and most of the *Sacium picaulium* were beaten from dead palm-leaves, a very fruitful source of beetle-life. Two individuals of the *Lewisium* were found in a fallen branch containing an ant's nest (see p. 24), though whether their presence was accidental or intentional I cannot say.

Affinities.—The world-fauna of creatures so minute as Corylophidæ must be at present but very imperfectly known, therefore it is not profitable to discuss at length the affinities of the Seychelles series. Moreover, having regard to the highly peculiar nature of the endemic vegetation, and to the large number of peculiar insects and other animals existing there, it is probable that some at least of the species herein described will prove to be absolutely confined to these islands. But such indications of affinities as exist may be briefly considered for what they are worth.

The only form referred to a previously described species is *Orthoperus minutissimus*, Matth., hitherto recorded from S. America and W. Indies. The new genus *Daubania* is allied to *Oligarthrum*, known only from S. America, and to *Corylophus*, widely distributed in Europe and Asia. *Meioderus* was previously recorded only from Japan, *Lewisium* from Ceylon and Japan. The other genera are known from all parts of the world.

The Corylophid fauna of Madagascar appears to be very little known. The only species included in Alluaud's 'Liste des Insectes Coléoptères de la Région Malgache' * (p. 105) is *Sacium monstrosus* (Schaufuss) †, which, from its description, seems quite unlike any of the Seychelles forms. Matthews describes his *Sacium bifasciatum* (Mon. p. 54) from Madagascar, and this is a little like my *Sacium picaulium*. I have found no further records of Corylophidæ

* Vol. xxi. of Grandidier's 'Histoire Physique, Naturelle, et Politique de Madagascar,' Paris, 1900.

† = *Cypenster monstrosus*, Schaufuss, Tijdschr. Ent. xxxiv. 1891, p. 2; Matthews, Mon. Corylophidæ, p. 217.

from Madagascar in the subsequent literature. Reitter's (1908) descriptions of E. African species have been studied, but without seeing specimens it is hard to pronounce on their relationships with those of the Seychelles. In comparing the latter with forms in Matthews's collection, I have several times found that the nearest to the Seychelles species are Oriental forms, from Ceylon, Japan, &c. (*cf.* the distribution of the genera *Meioderus* and *Lewisium*, mentioned above), but the resemblance is not generally very close. However, if these apparent indications of Oriental affinities should prove genuine, this would only tally with what has been found so strongly marked in certain other groups of Seychelles insects.

On the whole, the Seychellian forms are *very minute, even for Corylophidae*. In comparing, I have been repeatedly struck with their small size in relation to their congeners.

STRUCTURE.—Various anatomical points are dealt with under the headings of particular genera and species. Thus *secondary sexual characters* have come to light in *Rhyphobius* and *Orthoperus*, and differential specific characters in the form of *antennae* and *mouth-parts* in certain species of *Sacium*, *Sericoderus*, and *Lewisium*—in *Sacium* also in the form of the *prosternum*. Attention is called to the presence of diverging metasternal striae in *Orthoperus*.

The *condition of the hind wings* is stated, so far as it has been examined, in the case of each particular species. I follow Matthews in using the term "ample" to denote that the wings are not reduced, vestigial, or absent, but much longer than the elytra, under which they are folded. It appears that they are ample in ten out of the fifteen species dealt with below, the remaining five being:—*Arthrolips* sp. indet., wings present but could not be examined; *Arthrolips flavicollis*, Matth., *Orthoperus minutissimus*, Matth., and *Orthoperus* sp. indet., wings not examined; *Rhyphobius aquilinus*, sp. n., wings present and longer than the elytra in the ♂, but seemingly quite absent in the ♀. This last case is interesting, exhibiting a sexual difference in the wing-development. The genus *Rhyphobius* (= *Moronillus*) is said by Ganglbauer (Käf. Mitteleur. iii. pp. 273, 283-4) to have the hind wings quite absent. Matthews makes the less general statement (Mon. pp. 172-3) that these organs are absent in the "genotype," *R. marinus*, Leconte, but says nothing of their condition in the other species. In a pair of the European *R. ruficollis* (Duval) which I have examined I find no trace of hind wings in either sex. I have not investigated their condition in other species of the genus.

Matthews also states (Mon. pp. 109, 115) that the hind wings are either absent or small and narrow in *Scrioderus* and *Anisomeristes*, but in those specimens of *S. (A.) seychellensis*, sp. n., which I have dissected they are much longer than the elytra. For the rest Matthews describes them as "ample" in his diagnoses of all the other genera except six, in which he either states that he had not examined them or does not mention them at all. But in the case of some genera examination of larger numbers both of species and individuals is probably required.

TECHNIQUE.—In fixing the generic position of species I have never relied on general appearance alone, but have in all cases made balsam-preparations of antennæ and mouth-parts for examination under the compound microscope. These preparations are mounted between two cover-slips, one of which is attached to a cardboard framework; the thinness of the glass then allows of both sides of the object being viewed through a high-power objective, while the cardboard framework admits of the preparations being pinned beside the insects. Balsam-preparations appear almost essential in dealing with *Corylophidæ*, and are indispensable in describing any new genus.

Measurements of length have been made with a calibrated micrometer-eyepiece. *Drawings* made with the aid of a drawing-apparatus.

For comparison I have used the British Museum Collection, which, including Matthews's Collection and his balsam-preparations, is fairly complete up to the date of his 'Monograph' (1899). Descriptions of older forms not included in the Monograph, and of all species and genera described since, have been consulted.

LITERATURE.—Matthews's 'Monograph of Corylophidæ and Sphæridæ' appeared in 1899, after its author's decease. A number of species unknown to him were not included in his manuscript, but the editor of the Monograph refers to these on pp. 19–21 and p. 217. The Monograph may therefore be taken as a fairly complete enumeration of the species up to and including 1899.

The following is a list of the subsequent literature, compiled from the 'Zoological Record,' the nature of each work being briefly indicated. Though a catalogue of the family has recently appeared, this list may also be of some use:—

1900. CASEY. Journ. New York Ent. Soc. viii. pp. 60–75, review of N. Amer. forms, describing several new genera and species: *Bathona*, g. n., *Granecus*, g. n., *Eutritia*, g. n. near *Orthoperus*, *Motanda*, g. n. near *Sacium*.

1900. DODERO. Ann. Mus. Genova, xl. p. 555, records *Sacium formosum*, Matth., from Burmah.
- REITTER. Wien. ent. Zeit. xix. p. 132, synonymic notes; Deutsch. ent. Zeitschr. p. 82, describes *Sericoderus chobauti*, sp. n., from S. France (see 1905).
1901. REITTER. Deutsch. ent. Zeitschr. p. 70, *Orthoperus acariformis*, sp. n., from West Turkestan.
1902. REITTER. Wien. ent. Zeit. xxi. p. 137, *Orthoperus schneideri*, sp. n., from Corsica.
1903. FAUVEL. Rev. Ent. Franc. (Caen), xvii. pp. 289-291, three new species of *Arthrolips* and one of *Corytophus* from New Caledonia*.
- MORRILL. Ent. News (Philadelphia), xiv. pp. 135-138, pl. vi., metamorphosis of *Corylophodes marginicollis*.
1905. REITTER. Wien. ent. Zeit. xxvii. pp. 59-63, describes a number of forms from E. Africa (*Monocryptinus*, g. n. near *Sericoderus*, and new species of *Sacium*, *Arthrolips*, *Sericoderus*, *Corytophus*, and *Orthoperus*); t. c. p. 198, synonymic notes, and sinks *Sericoderus chobauti*, Reitt. (1900), as a var. of *S. reitteri*, Reitt.
- SCOTT. 'Fauna Hawaiianensis,' iii. pp. 415-8, includes description of *Sacium angusticollis*, sp. n. [omitted by Csiki from his Catalogue, 1910].
1909. REITTER. Bull. Soc. ent. Egypte, i. (1908) p. 40, descr. *Sericoderus (Anisomeristes) psicirrhous*, sp. n., from Egypt.
1910. BLANCHLEY. Bull. Indiana Dept. Geol. i. pp. 501-506, describes Indiana species.
- CSIKI. Rev. ent. Lapok, xvii. p. 28, synonymic notes and new names; Coleopt. Catalog. (Jank & Schenkling), part 18, pp. 5-28, catalogue of the family.
1912. SHARP and MUIR. Tr. Ent. Soc. London, p. 507, ♂ genital armature.
1913. HETSCHKO. Wien. ent. Zeit. xxxii. p. 181, *Matthewsiella*, nom. nov. for *Microta*.
- REITTER. Deutsche ent. Zeitschr. pp. 653-4, *Sericoderistes*, gen. nov. near *Sericoderus*, with a new species, from Turkestan.
- SAHLBERG. Öfv. Finsk. Vetensk.-Soc. Förh. (Helsingfors), vol. lv. 1912-13, Afd. A, no. 8, p. 12, *Catoptya leconteus*, sp. n., Lebaenon.
1914. BROUX. New Zealand Institute, Bull. 1, part 3, p. 173, *Sacina curtula*, sp. n., New Zealand.

In the following portion of this paper dates in brackets after authors' names refer to the above list.

* In this paper Fauvel also records (p. 289) *Arthrolips saundersi* (Mont.) from New Caledonia. This species was described by Moutoussier from that country as one of the Heteromera, being made the type of a new genus *Apelta* (Ann. Soc. Linn. Lyon, vol. xi. 1894, p. 124), and as such it is included in the Munich Catalogue (vol. vii. p. 1172) under Tenebrionidae. But Fauvel, as stated above, records it as a Corylophid, giving *Apelta* as a synonym of *Arthrolips*. The name *saundersi* does not, however, appear to be mentioned in Csiki's 'Catalogue of Corylophidae' (1910) either as a valid species or as a synonym.

TYPES.—A first set of the material, including the types of the new genus and of all new species, will be placed in the British Museum; a second set will be retained in the Cambridge University Museum.

SACIUM, Leconte.

(Pl. I. figs. 1-9.)

Sacium, Leconte, Proc. Ac. Philad. vi. 1852, p. 142.

The material includes four species from the Seychelles, all quite distinct from each other and from anything in Matthews's collection; neither do the descriptions of the few species which I have not seen correspond at all with any of the Seychelles forms. Reitter (1908) has described five species from East Africa; but after careful study of his descriptions I conclude that none of my species is identical with any of his.

Structural Characters.—In examining the Seychelles collection I have noticed certain structural differences between the species, of a kind which does not seem to have been hitherto employed. Thus, among these four species there are two distinct types of *prosternum*: (i.) of appreciable length in front of the coxæ and furnished with an elevated median keel (fig. 6); (ii.) exceedingly short in front of the coxæ and with no keel (fig. 3); further details are given in the specific descriptions. Matthews (Mon. p. 41) writes "*prosterno parvo, inter coxas elevato . . .*," but makes no statement as to specific differences in its form.

Another category of characters is exhibited by the *mouth-parts*. A balsam-preparation was made in order to fix with certainty the generic position of each species. These preparations exhibit slight differences in the form and relative proportions of such parts as the mentum and joints of the palpi, differences which are briefly mentioned in each description (cf. figs. 2, 5, 8, 9).

Characters such as these are not necessary for separating the Seychelles species, which are amply distinct in other ways. But they are indicated in case they should prove useful in further studies of this large genus of minute creatures.

1. *Sacium picaultianum*, sp. n.

(Pl. I. figs. 1-3.)

Oblongo-ovale, supra nitidissimum, fere glabrum; piceo-nigrum, thoracis margine anteriore testaceo, elytris maculis 4 (in utroque

elytro 2) rufo-flavis, corpore subtus rufo-piceo, pedibus rufo-testaceis, antennarum clavis infuscatis; supra tote fortiter dense punctatum, thoracis basi plus minusve regulariter seriatim punctata; metasterno et segmento 1^o abdominis subtiliter dense punctatis.

Long. corp. 1.05-1.25 mm.

Oblong-oval, with elytra nearly parallel-sided, not very much broader than the thorax at their widest point; upper surface very shining, with the punctures bearing such excessively short minute hairs (only visible under a compound microscope) that it may almost be called glabrous.* *Colour*: thorax pitchy black, with the anterior explanate margin translucent and testaceous, the testaceous colour extending back a little on to the disc in two places, one on either side of the middle line in front; scutellum black; elytra pitchy black, with two reddish-yellow marks on each, the front pair of marks extending from the base to $\frac{2}{3}$ the length or more, fairly widely separated from the outer margins and at the suture; the hind pair only very narrowly separated at the suture, sometimes quite confluent across it, fairly widely separated from the apex of the elytron, each mark extending obliquely forwards from the suture nearly to the outer margin. In a few examples the spots of the front pair also are nearly confluent across the suture; and in some (possibly immature) the whole elytra are much paler, almost uniform pitchy reddish or even testaceous. Underside reddish pitchy, apex of the abdomen rufescent. Legs reddish testaceous. Clubs of antennæ dark. *Thorax* and *elytra* closely and strongly punctured, the punctures separated by from once to twice their own diameter, the thorax with a basal series of more closely placed punctures (very distinct in the figured specimen, but less regular in others); *elytra* with lateral margins reflexed and visible from directly above throughout the greater part of their length; sutural stria present, obsolete in about the anterior $\frac{1}{3}$. *Wings* dissected out and found to be ample. *Metasternum* and *abdomen* finely and closely punctured and finely pubescent; the punctuation more sparse on the postero-median part of the metasternum.

Prosternum (Pl. I. fig. 3) extremely short, forming in front of each coxa a bridge so narrow that it can scarcely be seen in looking directly down on to the under surface; there is consequently no room for a median elevated keel in front of the coxæ (contrast *Sacium grossinianum*, fig. 6). A balsam-preparation of the mouth-parts shows that the

mentum (fig. 2) is narrow, pointed in front, and the terminal joints of the *labial palpi* slightly longer than the second.

Sacium picaultianum approaches three species which I have seen—*S. bifasciatum*, Matth. (Madagascar), *S. quadrimaculatum*, Matth. (Ceylon), and *S. flaviventre*, Matth. (Ceylon), Mon. pp. 53, 54. *S. bifasciatum* is slightly longer in proportion, more tapering behind, much more finely punctured, with the basal thoracic series much less distinct, and the light marks on the elytra less sharply defined and differently arranged. *S. quadrimaculatum* and *S. flaviventre* are both larger and differently shaped in outline, having the elytra less parallel-sided and broadening out rather more behind the shoulders; both have the disc of the thorax dark red instead of pitchy black and the marks on the elytra much smaller; moreover, the upper surface is entirely glabrous, the punctures being devoid of even such minute hairs as are present in *S. picaultianum*. The latter is quite distinct from any of the three.

Loc. Seychelles: Silhouette Island, 1908.

Fifteen specimens. Nine were braten from dead palm-leaves on the Mare aux Cochons plateau, over 1000 feet, 25. ix. 1908; five others are from the same locality, though how obtained is not recorded; and one is from the other side of the island, near Mont Pot-à-eau.

Named after Captain Lazare Picault, who commanded one of the earliest expeditions to the Seychelles, in 1742*.

2. *Sacium grossinianum*, sp. n.

(Pl. I. figs. 4-6.)

Oblongo-ovale, supra sat nitidum, subtiliter dense punctatum atque pubescens, piceo-nigrum, thoracis margine anteriore late testaceo, elytris fasciis 2 transversis rufo-flavis, in sutura interdum anguste interruptis; metasterno et segmento 1^o abdominis nigris, thorace subtus et segmentis posterioribus rufescentibus, pedibus antennisque rufo-flavis, harum clavis haud nigricantibus.

Long. corp. 1.15 mm.

Oblong-oval, with thorax rather long, its anterior margin forming a curve that narrows considerably in front, and with elytra nearly parallel-sided, but considerably broader than the thorax at their widest point; upper surface fairly shining, covered with fine, short, decumbent, pale pubescence.

* For this and other historical particulars, see J. Stanley Gardiner, "The Seychelles Archipelago," *Geographical Journal*, Feb. 1907, pp. 148-174.

Colour: thorax pitchy black, with front margin rather broadly reddish testaceous; elytra pitchy black, with two broad transverse reddish-yellow fasciæ, the anterior or both of which may be narrowly interrupted by darker colour at the suture, thus almost forming four separate marks; in one example the scutellum is included in the anterior pale fascia, in another it is darker; metasternum and first abdominal segment pitchy black, posterior segments paler; underside of thorax, legs, and antennæ reddish yellow, clubs of the antennæ not black. *Thorax* and *elytra* closely and very finely punctured, the punctures twice their own diameter, or rather more, apart; the thorax has no distinct basal series, but an impressed line immediately before the base; sutural stria present but vanishing in nearly the anterior $\frac{1}{2}$; lateral margins of elytra reflexed through about $\frac{2}{3}$ the length from the shoulder, visible from directly above. *Wings* apparently ample, but not dissected out. *Metasternum* and *abdomen* finely and closely punctured and pubescent.

Prosternum (Pl. I. fig. 6) much longer than in *Sacium picaultianum*, forming in front of each coxa a bridge about half as broad in an antero-posterior direction as the dimensions of the coxæ in the same direction, and having a sharply elevated median longitudinal keel. A balsam-preparation of the mouth-parts shows that the *mentum* (Pl. I. fig. 5) is broader, not pointed in front, more like Matthews's figure (pl. i. D 6).

Several species resemble this in general scheme of colour, but its pubescent surface distinguishes it in many cases, and I have seen none very closely similar to it. Among the other Seychelles species it is abundantly distinct from *S. picaultianum* by its pubescence, its narrower form, finer punctuation, longer prosternum, by the confluence of the light marks on the elytra to form transverse fasciæ, &c.

Loc. Seychelles: Silhouette Island.

Three examples, from the same place as most of the preceding species, the Mare aux Cochons plateau or near by, ix. 1908.

Named in memory of Captain Grossin, a member of Picault's expedition to the Seychelles in 1742.

3. *Sacium roslanianum*, sp. n.

(Pl. I. figs. 7 & 8.)

Late ovale, supra nitidissimum, tote glabrum, modice sat dense punctatum: picco-nigrum, margine anteriore thoracis late pallide testaceo, elytro utroque macula singula media rufo-flava, corpore

subtus piceo, pedibus piceis vel fusco-testaceis, antennarum clavis fuscis.

Long. corp. 1.0 mm.

Rather shortly and broadly oval, with thorax forming almost a perfect semicircle (not a narrowing curve), and elytra considerably wider than the thorax, reaching their widest point a little before the middle; shining and entirely glabrous above. *Colour*: pitchy black; front margin of the thorax broadly pale testaceous and translucent; each elytron has a median pale spot, narrowly separated from its neighbour at the suture, more widely separated from the outer margin; in one specimen the spots are clear yellow, in others darker, reddish, and suffused; the black ground-colour is slightly diluted at the apices of the elytra; underside pitchy; legs pitchy or fusco-testaceous, with paler tibiae; head and clubs of antennae dark. *Thorax* and *elytra* moderately strongly and closely punctured; lateral margins of elytra reflexed throughout the greater part of their length, visible from directly above; sutural stria present, vanishing in the anterior portion. *Wings* apparently ample, but not dissected out. *Metasternum* and *abdomen* with remote punctures bearing fine short hairs, the former nearly impunctate in the middle.

Prosternum in front of each coxa forming a bridge of considerable breadth in an antero-posterior direction, and having an elevated median longitudinal keel, *i. e.* approaching the condition found in *Succium grossinianum* (cf. fig. 6). The balsam-preparation of the mouth-parts shows that the *mentum* (fig. 8) is rather narrow and bluntly pointed in front, the apical joints of the *labial palpi* shorter than the second (contrast *S. picautianum*), and the penultimate (third) joints of the *maxillary palpi* proportionately longer than in some other species.

Succium concinnum, Matth. (Ceylon), *S. formosum*, Matth. (Ceylon), and *S. politum*, Matth. (Japan) [Mon. pp. 52, 56, 57], all have the same general scheme of colour—each elytron with a single pale mark on a dark ground. *S. rosaurianum* is, however, quite distinct from them all. *S. concinnum* is differently shaped, having the elytra very little wider than the thorax, its punctuation is much closer, and the light marks on the elytra are more longitudinal in direction and much more widely separated from the outer margins and from one another. *S. formosum* is larger, longer, and narrower, with thorax forming a longer narrowing curve; also its thorax is reddish instead of black, and the pale marks lie farther back on the elytra and are much more widely

separated at the suture; the punctuation also is finer. *S. politum* is much larger, proportionately longer, and narrower, with red thorax; its pale marks are much shorter in an antero-posterior direction—*i. e.*, they form a narrow transverse fascia on the elytra.

Loc. Seychelles: Silhouette and Mahé, 1908-9.

Five specimens, from the high forests. In Silhouette two were found, near Mont Pot-à-eau (ca. 1500 feet), and at Mare aux Cochons; in Mahé three, from Cascade Estate at about 1000 feet, and from the Mare aux Cochons district at about 1500 feet.

Named after Monsieur du Roslan, under whom an early expedition visited the Seychelles in 1769.

4. *Sacium rochonianum*, sp. n.

(Pl. I. fig. 9.)

Minutum, ovale, supra nitidissimum, glaberrimum, omnino impunctatum; thorace rufo-flavo; elytris piceo-nigris, vel unicoloribus, vel fascia pallida transversa suffusa, plus minusve distincta, munitis; metasterno piceo-nigro, abdomine rufescente, ore antennis pedibus flavis, antennarum clavis haud nigricantibus.

Long. corp. 0.9-1.0 mm.

Minute, oval, the front margin of the thorax forming an elliptical curve narrowing slightly in front, sides of the elytra gradually curved, reaching their widest point a little before the middle; very shining, absolutely impunctate, and glabrous above. *Colour*: thorax unicolorous reddish yellow, rather paler at the front margin; scutellum in most examples reddish yellow, in some darker; elytra pitchy black, diluter at the apices; in some specimens practically unicolorous, but in most there is near the suture just behind the middle a paler area, which, though very indistinct in some, in other cases forms a suffused transverse pale fascia; metasternum pitchy black, underside of thorax yellowish testaceous, of abdomen reddish; head, antennae, and legs yellow, clubs of the antennae not darkened. *Elytra* with lateral margins narrowly reflexed throughout most of their length from the shoulder, these margins visible from above immediately behind the shoulder and again in the posterior half, but scarcely visible (or invisible) for a short space just before the middle; sutural stria present, extending forwards a little beyond the middle. *Wings* apparently ample, but not dissected out. *Metasternum* quite smooth, glabrous, and impunctate in the middle, with scanty very short pubescence at the sides; *abdomen* with longer yellowish pubescence.

Prosternum formed rather as in *Sacium picaultianum*, very short, forming only a very narrow bridge in front of each coxa, and sloping steeply upwards (*i. e.*, dorsalwards) in the middle in front, not forming a median keel. The balsam-preparation of the mouth-parts shows that the *mentum* (fig. 9) is broader than long (contrast *S. picaultianum*).

No species which I have seen is closely like this. The Hawaiian *S. angusticollis*, Scott (1908, p. 416), resembles it in its minute size and general colour-scheme—red thorax and black elytra. But *S. angusticollis* is distinctly though finely punctured and pubescent above, and is proportionately longer and narrower, less oval in outline, and with elytra less broadened about the middle.

Loc. Seychelles: Silhouette, 1908.

Fifteen examples, all from the high endemic forest above Mare aux Cochons, well over 1000 feet.

Named after the Abbé Rochon, a member of du Roslan's expedition in 1769; he left a written record, and his name has been given to a river in Mahé.

ARTHROLIPS, Wollaston.

The material includes three species—*A. flavicollis*, Matth., hitherto known from Java, an example of which is now recorded from Rangoon; *A. insula-longae*, sp. n., from the Seychelles; and an undetermined species from the Seychelles. Since the appearance of Matthews's Monograph, Fauvel (1903) has described three new species from New Caledonia, and Reitter (1908) two new species from East Africa. But those before me do not appear to be identical with any of these.

5. *Arthrolips flavicollis*, Matthews.

Arthrolips flavicollis, Matthews, Ann. & Mag. Nat. Hist. (5) vol. xix. 1887, p. 107; Mon. Corylophide, p. 92.

One example, agreeing closely with the type.

Loc. Rangoon; from nest of *Munia striata*, 9. x. 1911 (Dr. H. H. Marshall). Previously recorded from Java.

6. *Arthrolips insula-longae*, sp. n.

(Pl. I. figs. 10, 11.)

Sat breviter ovalis, convexus, nitidus, castaneus, fere unicolor, sed elytris ad latera et antice ad suturam indistincte infuscatis, pedibus antennisque castaneis, harum clavis haud nigricantibus; corpore supra subtusque dense punctato, pallide pubescente.

Long. corp. 1.15–1.25 mm.

Rather shortly oval, more convex than several of its congeners, shining, castaneous, almost unicolorous above and beneath, but with the front margin of the thorax paler and a dark mark on its disc where the head shows through the chitin, and with indistinct dark areas along the sides of the elytra and near the front part of the suture, the latter forming a median dark mark common to the two elytra; legs and antennae castaneous, the latter with the clubs not darker; body above and beneath covered with fine pale yellowish pubescence. *Thorax* with base almost straight, only very slightly sinuate on either side of the scutellum, with surface finely punctured, the punctures about twice their own diameter apart. *Scutellum* finely punctured. *Elytra* about as long as their combined breadth, with sutural stria indistinct (not indicated in fig. 10 and in some positions hardly visible) and obsolete in the anterior $\frac{1}{3}$, more strongly punctured than the thorax, punctures about twice their own diameter apart; reflexion of lateral margins very slight, scarcely noticeable from above. *Wings* apparently ample, but not dissected out. *Ventral surface* closely punctured, except the middle of the metasternum, which is almost impunctate.

It is not easy to describe the differences separating this form from others. It is not identical with any species I have seen. The following four are selected from Matthews's collection for comparison, as they seem nearest to it. *A. testudinalis*, Woll. (Madeira), is larger, less convex, more parallel-sided, with the dark areas at the sides and suture of the elytra contrasting much more strongly with the paler areas between, and the elytral punctures very much closer. *A. croceus*, Matth. (Siam), is narrower, much less convex, more parallel-sided, and much paler and yellower; in punctuation it is not unlike *A. insula-longae*. The same remarks apply very nearly to *A. senegalensis*, Matth. *A. westwoodi*, Matth. (Ceylon), is larger, proportionately longer, less convex, and generally lighter in colour, though with the darker areas on the elytra much the same as those of *A. insula-longae*; its antennae are much lighter coloured, being bright yellow; in punctuation it is not far removed from *A. insula-longae*. The latter differs from all these four species in its shorter, more convex, less parallel-sided form, as well as in the other ways mentioned in each separate case.

Reitter (1908, p. 61) has described a species—*A. centrimaculatus*, from East Africa—which seems to resemble *A. insula-longae* in many respects; but without seeing a specimen it is hard to say exactly how the two forms are related. *A. centrimaculatus* is described as "breviter ovalis,"

but as "levissime convexus" and "dilute fulvus," whereas *A. insulæ-longæ* is more convex than several of its congeners and dark castaneous. The dark areas on the elytra of *A. centrimaculatus* appear to be in the same positions as those of *A. insulæ-longæ*.

Loc. Seychelles: Long Island, a small coconut-planted islet close to Mahé, vii. 1908. Eight specimens, obtained by beating (probably from coconut-trees).

7. *Arthrolips* sp.

A single specimen, in bad condition, with one elytron broken. So far as can be seen, the form is rather depressed and suboblong—that is, more nearly parallel-sided than in some allied species. Shining, thorax and elytra pitchy black, the thorax paler (dirty ferruginous) in front, and the apices of the elytra, where the light shows through, appearing pitchy ferruginous. Underside of thorax ferruginous, metasternum and first abdominal segment pitchy, hind margins of abdominal segments testaceous. Legs ferruginous; clubs of antennæ not black. Body above covered with fine pale pubescence, much worn in the unique example. *Thorax* very finely and subobsoletely punctured. *Scutellum* and *elytra* with stronger, larger punctures, about their own diameter apart; sutural stria very fine and close to the suture, but distinguishable through almost the whole length of the elytron excepting right at the base. *Wings* present, but not examined. *Ventrally*, metasternum and first abdominal segment finely and rather closely punctured, the punctation reticulate towards the sides; the pale pubescence is rather dense, especially towards the sides of the sternum and hind margins of the abdominal segments.

Length 1.0 mm.

As the specimen is unique and in bad condition, I have not named it, though it is not identical with any examples I have seen. *A. oblongus*, Matth. (Japan), has the same shape and colour, but is much larger and differently punctured, its thoracic punctures being stronger, while conversely the elytral punctures are finer and more remote.

Loc. Seychelles: Silhouette, from Mare aux Cochons or the forest near by, over 1000 feet, 1908.

MEIODERUS, Matthews.

Meioderus, Matthews, Mon. Corylophidæ, p. 102.

This genus was erected to include a single species—*M. nitidus*, Matth., from Japan,—till now its only known repre-

sentative. The new form described below agrees closely with *M. nitidus* in generic characters—in general shape, form of antennæ, mouth-parts, sterna, tarsi, &c.,—but is quite distinct in specific characters.

8. *Meiolerus quinsyannus*, sp. n.
(Pl. II. fig. 12.)

Sat late ovalis, supra fortiter nitidus, omnino glaber; prothorace unicolore, rufo, scutello elytrisq. unicoloribus, piceis, corpore subtus fusco-testaceo, pedibus antennisque testaceis, harum clavis haud nigricantibus; prothorace fere impunctato, elytris subtiliter remote punctatis, sine stria suturali.

Long. corp. ca. 1.1 mm.

Rather broadly oval, moderately convex, very shining, and quite glabrous above. *Colour*: prothorax unicolorous reddish, the colour broadly diluted at the translucent front margin, scutellum and elytra unicolorous pitchy, underside brownish testaceous, legs and antennæ testaceous, clubs of antennæ not blackened. *Thorax* rather short, its front margin forming a wide curve; for ordinary purposes it may be called impunctate, though under a very high power a few very remote and exceedingly fine punctures are visible, as indicated in fig. 12. *Elytra* gradually curved, with lateral margin narrowly reflexed, though when viewed from directly above this is generally visible only in front, as shown in fig. 12; punctures fine, remote, shallow, slightly elongate; sutural stria entirely absent. *Wings* ample (mounted in balsam). *Metasternum* and *first abdominal segment* glabrous, the former impunctate in the middle, finely and remotely punctured at the sides, the latter finely and remotely punctured.

M. nitidus, Matth., is larger, more elongate-ovate in outline, with thorax much darker; the elytra are much deeper black, their punctuation is, if anything, a little stronger, and a sutural stria is discernible in the posterior part; the ventral surface is much blacker and the metasternum more closely punctured at the sides. When the ventral surfaces of *M. nitidus* and *M. quinsyannus* are viewed side by side the greater relative breadth of *M. quinsyannus* is apparent, and the coxæ of its middle and posterior pairs of legs look even more widely distant, *inter se*, in spite of its smaller actual size.

Loc. Seychelles: Silhouette, viii.—ix. 1908.

Four examples, one from near Mont Pot-à-eau, at about 1500 feet, three from Mare aux Cochons, about 1000 feet.

This species is named after Monsieur Le Queau de Quinsy,

last of the French Governors of the Seychelles, who served the Monarchy, the Republic, the Empire, and, finally, the British Government.

SERICODERUS, Stephens.
(Pl. II. figs. 13-17.)

Subgenus ANISOMERISTES (Matthews).

Anisomeristes, Matthews, Ent. Mo. Mag. xxii. 1886, p. 225; Mon. Corylophidae, p. 103.

Sericoderus, pars, Reitter.

Anisomeristes, treated by Reitter, and here, as a subgenus of *Sericoderus*, is separated from true *Sericoderus* by having 11-jointed instead of 10-jointed antennæ. Otherwise the species of the two subgenera are closely alike, and it is impossible without examination of the antennæ to decide in which of them any particular form should be placed.

The difference is caused by the fusion of two joints—joint 3 and the succeeding one—in *Sericoderus*, s. str. But in some species at least of this subgenus there is a fine transverse line on the third joint, showing where the division would be if it were present. Fig. 17, made from a balsam-preparation, shows the antenna of a British specimen in the Crotch Collection placed as *S. lateralis*; fig. 17 a shows the elongated third joint more highly magnified, and it is clear, both from the shape of the joint and the presence of the transverse line, that it is made up of two joints fused. Figs. 16, 16 a illustrate the antenna of *S. (A.) pubipennis*, Sharp (Hawaiian Islands), and figs. 15, 15 a give that of *S. (A.) seychellensis*, sp. n. In *pubipennis* the separation of the joints is complete, but not so marked as in *seychellensis*; in *pubipennis* the two joints fit together very closely, while in *seychellensis* the distal one is distinctly narrowed at its base. The condition in *S. (A.) pubipennis*, therefore, seems to be transitional between that in *S. (A.) seychellensis* and that in *S. (s. str.) lateralis*. The antennæ also exhibit other differences in length and in the proportions of the joints *inter se*. But appearances are sometimes deceptive, and much depends on the exact position in which the antenna is lying in the balsam.

In many descriptions of *Sericoderus* spp. no mention is made of the antennæ, and the subgeneric position of some species is not satisfactorily established. Owing to this inadequacy of descriptions, it is hard to say exactly how certain described species are related to the Seychelles form. I have named the latter *S. (A.) seychellensis*, though it may possibly prove to

be identical with some described species which I have not seen.

Condition of hind wings: see *ante* (p. 4) and below.

9. *Sericoderus* (*Anisomeristes*) *seychellensis*, sp. n.
(Pl. II. figs. 13-15.)

Obconicus, nitidus, unicolor flavo-testaceus, pedibus antennisque flavescens, harum clavis haud nigrescentibus, sat longe aureo-pilosus; prothorace subtiliter punctato, inter punctos laevi; elytris fortius punctatis, inter punctos parum asperatis; antennis curtis.

Long. corp. 0.75-1.0 mm.

Obconic, of the form characteristic of *Sericoderus*—that is, with thorax broader than elytra and produced at the hind angles, and with elytra narrowing gradually from the base backwards, subtruncate at the apices, and with sides straight, not curved. *S. (A.) seychellensis* is narrower in proportion than some of its congeners. It is shining, unicolorous yellow-testaceous, with legs and antennæ yellowish, the clubs of the latter not (or only very slightly) darkened. Body covered above and below with golden pubescence, rather coarser and longer than, and not quite so close as, in some species. *Thorax* smooth, very finely punctured; *elytra* rougher, with coarser punctuation, which extends right to the base. *Wings* considerably longer than elytra (mounted in balsam).

Of all the forms which I have seen, the Hawaiian *S. (A.) pubipennis*, Sharp*, is nearest to *S. (A.) seychellensis*, but it is larger and has the pubescence and punctuation denser. It also differs in the form of the antennal joints (figs. 15, 15 a). In *seychellensis* the antennæ are short, less than $1\frac{1}{2}$ times the breadth of the head, while in *pubipennis* they measure over $1\frac{1}{2}$ times the breadth of the head. In *seychellensis* joint 2 is short and conspicuously broad in proportion, 3 and 4 are short and transverse, and the division between them is conspicuous, 4 being narrowed at its base, 5 is very little broader than long, 6 much more transverse, 7 conspicuously larger than 8, and the club-joints are short, 9 and 10 both being broader than long. In *pubipennis* (figs. 16, 16 a) joint 2 is proportionately much longer, 4 is differently shaped and much less narrowed at its base, 9 and 10 are longer, being about as long as broad. Perhaps characters of a more definite nature than some of those hitherto used may be found in

* Tr. Dublin Soc. iii. 1885, p. 128; Matthews, Mon. Corylophidæ, p. 121; Scott, 'Fauna Hawaiensis,' iii. p. 417 (1908).

the antennæ to distinguish a number of forms superficially much alike.

Among species which I have not seen, *S. eichelbaumi*, Reitter (1908, p. 62, E. Africa), seems to resemble *S. (A.) seychellensis* in some respects, but to differ (as, according to Reitter, l. c., does also the Australian *S. pallidulus*, Reitter) in having the punctuation of the elytra obsolete towards the base; also *eichelbaumi* and *pallidulus* presumably belong to the subgenus *Seroderus*, s. str., though this is not actually stated. Certain forms have been described from Australia by Lea* and from New Zealand by Broun†, but it is impossible to say exactly how they are related to *S. (A.) seychellensis*. *S. (A.) pecirkaus*, Reitter (1908), from Egypt, is, according to the description, different in shape, colour, and nature of the pubescence.

Loc. Seychelles: Silhouette and Mahé, 1903-9.

Over fifty specimens, varying considerably in size. In Silhouette several were swept from a grassy clearing at over 1000 feet, 30. vii. 1908, and a large number were beaten all together from one place on the edge of the forest at Mare aux Cochons, over 1000 feet, in the late afternoon of 18. ix. 1908; others were found in various localities both in the high forests and at lower elevations. In Mahé examples were taken in the high forest of Morne Blanc, on Cascade Estate, &c.

DAUBANIA, gen. nov.

(Pl. I. fig. 18; Pl. III. figs. 19, 21-24.)

Antennæ (ut in *Oligarthro*) 8-articulatæ, sed ab eis *Oligarthri* in forma articulorum differentes. Caput sub pronoto omnino obtectum. Genus in forma mandibulorum, maxillarum, labii, *Corylopho* affinis, sed ab hoc genere in numero articulorum antennarum differt.

Form (fig. 18) oval, narrowed behind, moderately convex, glabrous above. *Head* entirely concealed beneath pronotum. *Antennæ* (fig. 19) 8-jointed; joint 1 long, thickened, curved towards base; 2 pyriform, over twice as long as broad; 3 slender at base, a little longer than broad; 4 small, a little broader than long; 5 may be reckoned as part of the club, it and 6 are about as long as broad; 7 is rather broader than long; 8 is longer than broad and tapers to a blunt apex. *Labrum* (fig. 21) transversely oblong, anterior angles rounded, anterior margin slightly bisinuate. *Mandibles*

* Proc. Linn. Soc. New South Wales, vol. x. p. 309 (1895).

† Man. New Zealand Col. part 5, p. 1072 (1893).

in Mahé, from country above Port Gland, 500–1000 feet, and from the forest on Cascade Estate, between 800 and 2000 feet; Praslin, Côtes d'Or Estate.

LEWISIUM, Matthews.

(Pl. III. figs. 25–28, 30; Pl. IV. figs. 31, 32, 34, 35.)

Lewisium, Matthews, Mon. Corylophidæ, 1899, p. 164, pl. v. fig. A.

Lewisium was established for two species—*L. ceylonicum*, Matth. (*op. cit.* p. 166), and *L. japonicum*, Matth. (*op. cit.* p. 167), and no further representative of the genus has since been described. My material contains a long series of a species from the Seychelles, which is referred to *Lewisium* on account of its very close general resemblance to *L. ceylonicum*, but which in the form of its antennæ and mouth-parts differs from that species and in some ways more closely resembles *Catoptyx bowringi*, Matth. (Java), the type of the genus *Catoptyx**. The Seychelles form (*L. seychelleanum*, sp. n.) thus seems in some respects intermediate between the types of *Lewisium* and *Catoptyx*, and an examination of the actual parts in *L. ceylonicum* and *L. seychelleanum*, and comparison with Matthews's figures of *Catoptyx* renders one rather doubtful whether the differences between *Lewisium* and *Catoptyx* are more than specific. But one of the chief diagnostic characters of *Catoptyx* is that it has the *anterior angles of the pronotum abruptly inflexed and closely fitted to the sides of the head*, and of this there is no trace in *L. seychelleanum*. Therefore I do not propose to sink *Lewisium* as a synonym of the earlier name *Catoptyx*.

Antennæ, mouth-parts, &c.—The antenna of *L. seychelleanum* (figs. 25, 25 a) has the basal joint much thicker, the third joint proportionately much longer, than that of *L. ceylonicum* (figs. 26, 26 a). This forms a ready means of distinction in balsam-preparations. The labrum of *L. seychelleanum* (fig. 27) is intermediate between that of *Lewisium* and that of *Catoptyx bowringi* as figured by Matthews (copied in figs. 28, 29), being considerably more tapering than the former but much less acuminate than the latter. The mandibles of *L. seychelleanum* are bifid at the distal extremity, each of the two apices being armed with two or three hooks (figs. 30, 30 a)—i. e., rather more complex than those of *Catoptyx bowringi*, which, according to Matthews (pl. vi. fig. B 4), have only a single hook at each apex, but

* *Catoptyx*, Matthews, Ann. & Mag. Nat. Hist. (5) vol. xix. 1887, p. 111; Mon. Corylophidæ, p. 167, pl. vi. fig. B 1–7.

without the serrations that extend some way down the mandibles of *L. ceylonicum* (cf. Matthews, pl. v. fig. A 4). *Maxillary palpi* of *L. seychelleanum* (fig. 31) with joint 2 much less curved and inflated outwardly, and the apical joint shorter and blunter, than those of *L. ceylonicum* (fig. 32); *maxillary lobes* of *L. seychelleanum* slender, sharply pointed, with inner edge serrate near the apex [Matthews figures the lobes in *Lewisium* as unarmed; but a balsam-preparation of the maxilla of *L. ceylonicum* (fig. 32) shows about six minute teeth near the apex, though these are scattered on the surface, not arranged in a serrate edge as in *L. seychelleanum*]. Fig. 33, copied from Matthews, shows the maxilla of *Catoptyx bowringi* for comparison. *Labial palpi* of *L. seychelleanum* (fig. 34) lying nearly contiguous, not spread apart as in *L. ceylonicum* (fig. 35)*; fig. 36, copied from Matthews, shows the parts in *Catoptyx bowringi*. Therefore in the maxillæ and labium *L. seychelleanum* seems in several points to resemble *Catoptyx bowringi* more closely. *Tarsi* of all three pairs in *L. seychelleanum* broadly dilated and bilobed, the lobes pubescent.

11. *Lewisium seychelleanum*, sp. n.

(Pl. III. figs. 25, 27, 30; Pl. IV. figs. 31, 34.)

Late ovale, postice perparum angustatum, valde convexum, nitidissimum, supra glabrum; picco-nigrum, prothoracis margine antico pallide testaceo et pellucido, disco prothoracis ante scutellum, scutello ipso, elytrorum sutura et marginibus exterioribus (his anguste) picco-rufis, antennis pedibusque rufo-testaceis, antennarum clavis band nigricantibus; prothorace fere impunctato, elytris dense sat fortiter confuse punctatis. *Lewisio ceylonico* simile, sed statura minus, et differt in forma antennarum, mandibulorum, &c., quæ vide supra.

Long. corp. 1.05-1.1 mm.

Broadly oval, slightly narrowed behind, very convex, very shining, glabrous. Pitchy black, with anterior margin of the thorax pale testaceous and pellucid, and the middle of the disc of the thorax before the base, together with the scutellum and suture of the elytra, lighter—i. e., pitchy reddish; outer margins of the elytra also narrowly reddish [in a few specimens the reddish colour is more extended and the whole body is a little lighter]; underside pitchy reddish, centre of metasternum and first abdominal segment darker; legs, mouth,

* Too much reliance must not be placed on this difference, which may be partly due to greater pressure of the coverslip in one preparation than in the other.

and antennæ reddish testaceous, clubs of the antennæ not blackened. *Thorax* and *scutellum* under a powerful hand-lens appearing impunctate, but under a compound microscope the thorax is seen to bear numerous very fine subobsolete punctures. *Elytra* closely and strongly punctured, punctures separated by once to twice their own diameter; sutural stria not distinguishable. *Wings* dissected out and found to be ample. *Metasternum* rather closely and strongly punctured towards the sides, but with the elevated central part almost impunctate. *Aldomen* ventrally clothed with fairly close, fine, short hairs.

In general appearance closely resembling *L. ceylonicum*, Matth., which is, however, distinctly larger. The example of *L. ceylonicum* before me appears a very little less convex, has scarcely any reddish colour along the suture of the elytra, the elytra even more strongly punctured, and the metasternum almost impunctate at the sides as well as slightly less elevated in the middle. But differences of a more definite character lie in the form of antennæ and mouth-parts, as stated above.

L. seychelleanum is quite distinct in size and general appearance from the other previously described species of the genus—i. e., *L. japonicum*, Matth., and also from *Catoptyx boweringi*, Matth. A second species of *Catoptyx* has been described recently by Sahlberg (1913)—*C. levantinus*, from the Lebanon; but this is said to have the elytra "obsolete punctata" and the third joint of the antenna as long as broad, and must be quite different from *L. seychelleanum*.

Loc. Seychelles: Silhouette, Mahé, Long, Praslin, and Félicité Islands, 1908-9. Found much more abundantly than any other species, over 190 specimens being taken; the distribution seems fairly general, from sea-level and the cultivated country up into the endemic forests. In Silhouette many examples were collected from near Mont Pot-à-eau, ca. 1500 feet, and from Mare aux Cochons; a number were swept from long grass; one is recorded as beaten from dead palm-leaves; two were found in fallen dry branches containing nests of the ant *Pheidole punctulata*, Mayr (A. Forel det.), on the coast near Pointe Étienne, 17. ix. 1908. In Mahé, generally distributed from the cultivated country up to elevations of over 1000 feet. In Long Island, a cultivated islet near Mahé, a specimen was taken from the beach just above high-water mark.

RHYPوبيUS, Leconte.

Rhyppobius, Leconte, Proc. Ac. Philad. vi. 1852, p. 141.

Moronillus, Jacqu.-Duval, Ann. Soc. Ent. France, 1854, Bull. p. 38;

Gen. Col. Eur. vol. ii. 1857-59, p. 234.

Nec *Glaesoma*, Wollaston, Ins. Mader. 1854, p. 460, pl. x. fig. 7.

Rhyppobius, founded on the North-American *R. marinus*, Leconte, was originally (but erroneously) described as having 9-jointed antennæ. *Moronillus* was erected to contain the European *M. ruficollis*, Duval, and was correctly described as having the antennæ of eleven joints. In 1883 Leconte and Horn [Classif. Col. N. Amer. (Smithson. Misc. Coll. xxvi.) p. 113] asserted that *Rhyppobius* and *Moronillus* are really the same, and admitted that Leconte had wrongly stated the number of antennal joints in his original description of *Rhyppobius*. Matthews also followed these writers in regarding *Moronillus* as a synonym of *Rhyppobius* (Mon. Coryloph. p. 173). Ganglbauer, however (Käf. Mitteleur. iii. 1899, p. 283, footnote), was not satisfied that the number of antennal joints is really the same in the two cases, and therefore employed the name *Moronillus* as distinct from *Rhyppobius*. I have made a balsam-preparation of the antenna of a specimen of *R. marinus*, Leconte, from Matthews's Collection. It is undoubtedly 11-jointed, and closely resembles that of *R. aguilinus*, sp. n. (fig. 38). Leconte and Horn and Matthews were therefore right in regarding the number of joints as the same in the type-species of *Rhyppobius* and *Moronillus*. The character separating the two disappears, and *Moronillus* must be treated as a synonym of *Rhyppobius*. A preparation of the antenna of the West-Indian *R. brevicornis*, Matth., also shows eleven joints.

These remarks, however, do not apply to *Glaesoma*, Wollaston. This genus was founded for *Glaesoma velox*, Woll., which was described from a unique example found in Madeira, but of which other examples, subsequently taken in North Africa, are also to be seen in the British Museum. Wollaston described and figured the genus as having 10-jointed antennæ (an assertion which I am glad to be able to confirm, below). But Duval, in his Gen. Col. Europe, sank *Glaesoma* as a synonym of his genus *Moronillus*. To this Wollaston replied in his 'Coleoptera Atlantidum' (1865, pp. 93-5, and footnotes), saying that he had carefully re-examined the type of *G. velox*, and was convinced that his original figure and description were correct, that the antennæ were really 10-jointed, and that the joints differed in form

inter se from those of *Moronillus*. Nevertheless, Leconte and Horn and Matthews regarded *Gleosoma* (like *Moronillus*) as a synonym of *Rhyppobius*; but Ganglbauer (*l. c.*) was not convinced, and Casey (1900, p. 65) wrote that *Gleosoma* is altogether distinct from *Rhyppobius*. I have examined the type of *G. velox* under the highest power applicable to a carded specimen, and found that the antennæ appeared almost certainly 10-jointed; but being still not satisfied, I mounted in balsam the antenna of one of the North-African specimens, which seem absolutely identical with the type. This antenna (fig. 39) is 10-jointed, having between the second and the next large joint one small joint less than in *Rhyppobius*, and, as stated by Wollaston, the form and proportions of the joints differ from those of *Rhyppobius*. The three joints (5, 6, 7) preceding the three club-joints are all much longer in proportion than the corresponding three (6, 7, 8) in *Rhyppobius*, and the large middle one of the three especially is of a different shape.

If the number of antennal joints be used as the criterion for separating the genera, the matter may be summarized thus:—

Rhyppobius (= *Moronillus*), antennæ 11-jointed.

Gleosoma, antennæ 10-jointed.

Secondary Sexual Characters.—I do not know of any reference to these in *Rhyppobius*. But the material before me includes three specimens of a species, apparently new, two of which have a marked impression on the metasternum, while in the third this is quite absent. In comparing certain other species with mine, it was seen that some examples have impressions on the metasternum and sometimes on the first abdominal segment as well. Having before me two specimens of *Rhyppobius ruficollis* (Duval), one of which has the sternum impressed while the other has not, I dissected these and found that the insect with impressed sternum is ♂, while the other is ♀. I therefore infer that the ventral impressions are a ♂ character, though further study is needed to prove whether they are present in all or only in some species. Those in which they have so far been observed are:—

(i.) *R. ruficollis* (Duval), ♂: a rather faint and narrow longitudinal impression on the posterior $\frac{2}{3}$ of the metasternum, and a long narrow impression down the middle of the first abdominal segment.

(ii.) *R. brevicornis*, Matth., ♂: a deep and rather broader longitudinal impression on the metasternum; on the first abdominal segment a very broad and deep impression, extending the whole length of the segment and nearly the

whole distance between the hind coxæ; on either side of the impression the segment is raised into a ridge which bears rather long pubescence.

(iii.) *R. aquilinus*, sp. n., ♂: a marked longitudinal impression, broadening behind, along the posterior $\frac{2}{3}$ of the metasternum, the pubescence in the impression being much closer than on either side of it; first abdominal segment with no impression, but with a little median group of hairs.

Condition of hind wings: see *ante* (p. 4), and below.

12. *Rhyppobius aquilinus*, sp. n.
(Pl. IV. fig. 37; Pl. V. fig. 38.)

Ovalis, postice haud fortiter attenuatus, supra subtusque subtilissime alutaceus, thorace rufo-flavo, elytris castaneo-brunneis postice ad suturam interdum rufescentibus, pedibus antennisque flavescentibus, harum clavus haud nigricantibus; thorace impunctato; elytris punctis duplicibus sat confertim munitis; metasterno ♂ in medio longitudinaliter valde impresso, segmento 1° abdominis haud impresso.

Long. corp. 0.85 mm.

Outline shown in fig. 37; the thorax appears a little shorter than it actually is, owing to its being bent down; length of the elytra very nearly equal to their combined breadth, which is greatest a little before the middle. Body above shining, glabrous; finely and closely alutaceous above and beneath. *Colour*: thorax reddish yellow, elytra dark castaneous brown, in the type-specimen lighter and more reddish in the posterior half near the suture; ventral surface castaneous brown, antennæ and legs yellowish, clubs of the antennæ not blackened. *Antennæ* (fig. 38) a little longer than the width of the head from eye to eye. *Thorax* narrowly margined at the sides, with base very shallowly sinuate on either side of the middle, and hind angles (seen from the side) slightly less than right angles; surface impunctate. *Scutellum* rounded. *Elytra* with lateral margins narrowly reflexed, but in viewing a specimen from vertically above the margins are only visible behind the shoulder and again for a short space behind the middle; sutural stria quite absent; surface with fine double punctures, each consisting of two slightly elongated punctures lying close side by side*; in a transverse direction the double punctures are about their own diameter apart, but in a longitudinal direction about twice this distance. *Wings*: no trace of these

* The alutaceous surface and double punctures are characteristic of a number of other members of the genus.

organs can be seen under the partly opened elytra of the single ♀, but actual dissection and search for minute vestigial wings is prevented by the necessity of preserving the specimen intact; the two ♂ have ample wings, folded under the elytra; one of these organs is mounted in balsam, but I have failed to unfold it completely, so cannot state its proportions to the elytron accurately; it is, however, considerably longer than the elytron (see p. 4). *Metasternum* ♂ with a marked median longitudinal impression broadening behind, on the posterior $\frac{2}{3}$ of its length; surface of the metasternum almost impunctate, with pale short hairs, closer in the impression, very scanty at the sides; in the ♀ the metasternum is convex and glabrous in the middle. *First abdominal segment*: ♂, with no impression, but with a median group of a few short hairs, on either side of which it is bare, but has a few other hairs near the lateral margins; ♀, no median group of hairs. The other segments bear scanty pale pubescence.

This species is quite distinct from any I have seen. The form most closely resembling it superficially is *R. brevicornis*, Matth. (West Indies). A ♂ of this, now before me, is the same size, but more attenuated behind; the reticulation of its thorax is slightly less marked, while its elytral punctures are a little stronger; and it differs decidedly in the nature of its ♂ ventral impressions (*vide supra*, p. 26).

Loc. Amirantes Islands. Three specimens from Eagle Island, 1865 (H.M.S. 'Sealark' Expedition).

Named "*aquilinus*" in allusion to the island of its discovery.

ORTHOPERUS, Stephens.

(Pl. IV. figs. 40, 41; Pl. V. figs. 42-44.)

The material includes at least two, possibly three, species of this genus: a new and very distinct form from Rangoon; a single ♂ from the Seychelles, referred to a species known from S. America and W. Indies; and a single indeterminate specimen from Rangoon, possibly the ♀ of the preceding, possibly distinct.

Diverging Striæ on Metasternum.—I have found in the literature no mention of diverging striæ or lines on the metasternum, curving round behind the middle coxæ (fig. 41, *l.*); yet they are present in a number of species. They recall the diverging striæ found in a similar position in *Aeritis* and other Histeridæ, but in these there is a second pair of diverging striæ behind the hind coxæ on the first abdominal

segment, while in the *Orthoperi* there is only the pair on the metasternum. The species in which I have seen them are:—*aqualis*, Sharp, *ab-marinus*, Heer, *brunnipes*, Gyll., *coriaceus*, Rey, *crotchii*, Matth., *kluki*, Wank., *munia*, sp. n., *ovatus*, Matth. I have not examined the other species of the genus as to whether these striae are present or not.

Secondary Sexual Characters.—More than one writer has noted that the front tibiae of some *Orthoperus* are long and incurved at the apex. Thus Matthews, in his description of the genus (Mon. p. 182), "[anterior] tibiae often very long and much incurved, abruptly incurved at the apex"; and again, in his descriptions of some of the species, "anterior tibiae very long and strongly incurved," or, contrariwise, "anterior tibiae nearly straight" (see also his figure, pl. vii. fig. A 1). But it does not seem to have been stated that this difference in the form of the tibiae is, in some species at least, sexual. Thus, in *O. munia*, sp. n., the front tibiae of some specimens, which I infer to be ♂, are more incurved towards the apex, and have a sharp heel or spur at the inner apical angle (fig. 42); while those of other examples, presumably ♀, which in all other external characters appear identical with the preceding, are straighter and have no such heel (fig. 43). In this case the curvature of the ♂ tibia is not very marked, but it is much greater in *O. minutissimus*, Matth. (fig. 44). Dr. Sharp has pointed out to me the same kind of sexual difference in the form of the front tibiae in some of our British *Orthoperus*. The divergence of the sexes in this respect is sometimes quite sufficient to be seen with a hand-lens.

Casey (1908, p. 65) describes for certain North-American forms a new genus *Eutirilia*, one of the principal characters of which is that it has the front tibiae more flattened and less incurved at the apex than in *Orthoperus*. It will be necessary to discriminate between sexual and other differences before the limits of the two genera are made quite clear.

13. *Orthoperus munia*, sp. n.
(Pl. IV. figs. 40, 41; Pl. V. figs. 42, 43.)

Ovatus, valde convexus, nitidissimus, glaber, piceo-fuscus, pedibus antennisque testaceis, harum clavis infuscatis; thorace serie basali punctorum fortium ad latera hand attingente, in medio a basi magis distante, munito, disco subtilissime ac subobsolete punctato; elytris sat dense sed subtilissime ac subobsolete punctatis; ♂ tibiis anterioribus ad apicem parum incurvatis, angulo apicali interiore producto.

Long. corp. 0·7 mm.

Ovate, very convex, shining, smooth (not at all alutaceous), and quite glabrous above; body above and beneath and head pitchy fuscous; legs, palpi, and antennae testaceous, clubs of the latter infusate. *Head* impunctate. *Thorax* with its base sinuate on either side and produced backwards in the middle, with lateral margins (seen from the side) slightly sinuate in the middle, hind angles nearly right angles; with a strong basal series of rather elongate punctures, becoming obsolete at the sides, further removed from the actual base in the middle than at the ends of the series [it recalls the basal series of some species of *Aerilus*]; disc bearing a number of very fine subobsolete punctures, but in some lights and positions these are scarcely visible. *Elytra* of nearly the same length as their combined breadth, considerably larger than the abdomen, the outline of which is shown in fig. 40 appearing through the elytra as a dotted line (perhaps some allowance must be made for shrinkage of the abdomen); lateral margins not visible from directly above; the elytra have no trace of a sutural stria, and are finely and rather closely punctate; the punctures under a high power appear as fine elongate dashes, closer at the base and suture, and almost obsolete towards the apex (like those on the thorax, the punctures in some lights and aspects are difficult to see owing to their shallowness). *Wings* ample. *Metasternum* (fig. 41) very convex, impunctate in the middle, finely punctured at the sides, the diverging striae behind the middle coxae are punctured and run in a continuous curve from the anterior to the lateral margins of the metasternum. *Abdomen* in several specimens tapering to a blunt point, first segment almost impunctate, each segment with a series of very fine short hairs, rather wide apart. *Front tibiae* of ♂ (fig. 42) slightly incurved towards the apex, with the inner apical angle produced into a sharp heel; in both ♂ and ♀ (for the latter sex, see fig. 43) the excavation of the outer margin towards the apex is conspicuous. No other external sexual distinction is visible.

No species in Matthews's Collection resembles this at all closely, and those described since his time seem quite different. *O. japonicus*, Matth., has a basal thoracic series of punctures, but they are much finer; it is much larger than *O. mania*, has a minutely reticulate surface, and much closer elytral and thoracic punctation.

Loc. Rangoon. Six examples, found in nest of *Mania striata*, 9. x. 1911 (*Dr. H. H. Marshall*).

14. *Orthoperus minutissimus*, Matthews (?).
(Pl. V. fig. 44.)

Orthoperus minutissimus, Matthews, Mon. Corylophide, 1899, p. 196.

A single ♂, in bad preservation. Pitchy fuscous; legs and antennæ lighter, shining and quite glabrous above. Thorax not (or scarcely) punctured. Elytra finely and sub-obsolete punctured, the punctures more than their own diameter apart. Ventrally the metasternum is impunctate in the middle, but its sides and the first abdominal segment have very fine punctures several times their own diameter apart. Wings not examined.

So far as can be seen in its bad condition, the specimen agrees in size, colour, and punctuation with an example in Matthews's Collection from Grenada, West Indies, placed as *O. minutissimus* *. The two agree particularly in the form of the front tibiæ, which are sharply incurved at the apex, the inner apical angle forming a sharp heel. Fig. 44 shows the right-hand front tibia in the West-Indian specimen.

Loc. Seychelles: Silhouette, from Mare aux Cochons, 1000 feet or more, ix. 1908. *O. minutissimus*, Matth., is recorded from South America and West Indies.

15. *Orthoperus* sp.

Among the material from Rangoon is a single specimen, perhaps not fully mature, of a very minute species, quite distinct from *O. minia* by the absence of the basal thoracic series of punctures. In size and punctuation of the upper surface it is not unlike the example from Silhouette described above and referred to *O. minutissimus*. It is just possible that it is a ♀ of that species, since it probably belongs to the ♀ sex, the front tibiæ not being incurved and having no sharp heel. The metasternum appears quite impunctate, even at the sides; diverging striæ perfectly distinct but not punctured. Determination or further description of this form is impossible in the absence of more material. Wings not examined.

* The name and description of *O. minutissimus* are published in square brackets in Matthews's Monograph, from his own MS. notes, by P. B. Mason, editor of the Monograph. Mason gives reasons for thinking that Matthews probably intended to sink this name as a synonym of *O. perpallidus*, Matth. I have, however, provisionally retained the name *minutissimus*, since time has not admitted of an examination of Matthews's material sufficiently close to decide whether *minutissimus* and *perpallidus* are identical or not.

32 On Corylophidæ from the Seychelles and Rangoon.

Length about 0·7 mm.

Loc. Rangoon : from nest of *Mania striata*, 9. x. 1911
(Dr. H. H. Marshall).

EXPLANATION OF THE PLATES.

NOTE.—The figures of whole insects are approximately, but not exactly, to scale : they are magnified between 17 and 57 diameters, in most cases 50-53 diameters.

PLATE I.

- Fig. 1. *Sacium picaoltianum*, sp. n.
Fig. 2. Ditto. Mentum.
Fig. 3. Ditto. Under-side of prothorax and anterior coxæ.
Fig. 4. *Sacium grossianum*, sp. n.
Fig. 5. Ditto. Mentum.
Fig. 6. Ditto. Under-side of prothorax and anterior coxæ.
Fig. 7. *Sacium rufianum*, sp. n.
Fig. 8. Ditto. Mentum.
Fig. 9. *Sacium rochianum*, sp. n. Mentum.
Fig. 10. *Arthrolips insule-bugæ*, sp. n. Outline.
Fig. 11. Ditto. Punctuation and pubescence of thorax and elytra, to larger scale.
Fig. 12. *Danbania seychelliarum*, gen. et sp. n.

PLATE II.

- Fig. 12. *Meioderus quinquatus*, sp. n.
Fig. 13. *Sericoderus* (*Arisomeristes*) *seychellensis*, sp. n. Outline.
Fig. 14. Ditto. Sculpture and pubescence of thorax and elytra, to larger scale.
Fig. 15. Ditto. Antenna. 15 a, joints 3 and 4 more highly magnified.
Fig. 16. *Sericoderus* (*Arisomeristes*) *pubipennis*, Sharp. Antenna. 16 a, joints 3 and 4 more highly magnified.
Fig. 17. *Sericoderus* (s. str.) *lateralis*, Gyll. Antenna. 17 a, joint 3 more highly magnified, showing transverse line.

PLATE III.

- Fig. 19. *Danbania seychelliarum*, gen. et sp. n. Antenna.
Fig. 20. *Oligacthrum waterhousei*, Matthews. Antenna (from Matthews, Mon. Coryloph. pl. iv. fig. C 7).
Fig. 21. *Danbania seychelliarum*. Labrum.
Fig. 22. Ditto. Mandible.
Fig. 23. Ditto. Maxilla.
Fig. 24. Ditto. Labium.
Fig. 25. *Lewisium seychelliarum*, sp. n. Antenna. 25 a, joints 3-6 more highly magnified.
Fig. 26. *Lewisium cephalicum*, Matthews. Antenna. 26 a, joints 3-6 more highly magnified.
Fig. 27. *Lewisium* sp. Labrum (from Matthews, pl. v. fig. A 3).
Fig. 28. *Catoplys boeringi*, Matthews. Labrum (from Matthews, pl. vi. fig. B 3).
Fig. 30. *Lewisium seychelliarum*. Mandible. 30 a, apex of another specimen from a different point of view.

PLATE IV.

- Fig. 31. *Lewisium seychellense*. Maxilla.
 Fig. 32. *Lewisium ceylonicum*. Maxilla.
 Fig. 33. *Catoptyx boweringi*. Maxilla (from Matthews, pl. vi. fig. B 5).
 Fig. 34. *Lewisium seychellense*. Labium.
 Fig. 35. *Lewisium ceylonicum*. Labium.
 Fig. 36. *Catoptyx boweringi*. Labium (from Matthews, pl. vi. fig. B 6).
 Fig. 37. *Rhyphobius aquilinus*, sp. n. Outline.
 Fig. 40. *Orthoperus munice*, sp. n.
 Fig. 41. Ditto. Metasternum and first abdominal segment, middle and posterior coxal cavities shaded; *l*, diverging metasternal line or stria.

PLATE V.

- Fig. 38. *Rhyphobius aquilinus*, sp. n. Antenna.
 Fig. 39. *Glucosoma velox*, Wollaston. Antenna.
 Fig. 42. *Orthoperus munice*, sp. n. Anterior tibia and tarsus, ♂.
 Fig. 43. Ditto. Ditto, ♀.
 Fig. 44. *Orthoperus minutissimus*, Matthews. Anterior tibia and tarsus, ♂.

II.—*Notes on Exotic Chloropidæ*. By C. G. LAMB,
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THE following notes are based on material from two sources. The larger portion is the collection of Diptera in the Zoological Department of Cambridge University, and will be referred to as "Cam. Coll." In 1904 Mr. F. Muir presented a very large collection of Diptera from Africa to the Cambridge Museum, and his specimens will be marked "F. M." In addition, the Museum was indebted to Dr. G. A. K. Marshall for many other specimens from the same region, and there have been various other small accessory collections incorporated from time to time. The other portion consists of specimens kindly submitted to the author by Dr. G. A. K. Marshall—they are part of the extensive collection being formed by the Imperial Bureau of Entomology; this will be referred to as "Bur. Coll."

All the insects listed and described in the paper will be deposited in the British Museum, and hence no indication of the situation of the type-specimens will be given after the descriptions; they will all be in the British Museum.

The task of dealing with this family is enormously lightened and simplified by the valuable and complete monographs of Th. Becker, which bring the information

available up to the dates of publication of the same, and hence save much labour in searching out old records. These monographs are:—

I. Theil. Palearctic Region.
'Archivum Zoologicum,' i. 1910.

II. Theil. Ethiopic Region.
Ann. Mus. Nat. Hung. vii. 1910.

III. Theil. Indo-Australian Region.
Ann. Mus. Nat. Hung. ix. 1911.

IV. Theil. Nearctic Region, Neotropical Region, and Addendum.
Ann. Mus. Nat. Hung. x. 1912.

The last brings the list of known species in all the regions up to date; it also contains a discussion of Enderlein's new genera (Sitz. d. Gesell. Nat. Freunde, 1911), and clears up many points in that paper which at one time seemed likely to throw the classification into confusion.

These monographs will be shortly referred to by the numbers I., II., III., IV. after Becker's name.

As is so often the case, a considerable number of single specimens occur in both collections. Where the characters are quite unmistakable and striking, these single specimens have been described as the types of new species. When the specimen agrees with fair accuracy with any published description, it has been thought best to place the insect under the existing name; but in general it will be found that this fact is referred to, and any differences recorded.

The Chloropidæ form a very protean family and include great numbers of genera that run fairly closely into one another. It might be said that almost every positive character which limits the family may be separately absent in some genera—in fact, the allocation of an insect to the family is in many cases practically due to a "trained eye," and cannot be logically justified by the limits of the definitions of the family. This is possibly more true of this family than of any of the other Acalyptrate groups.

It naturally results that the generic limitations follow the same tendency, and that the original limits of a genus, as set by its founder, have to be transgressed, so that finally the "genus" sometimes bears little resemblance to the limited form originally prescribed. A good example of this is to compare *Gaurax* as founded by Loëw with Becker's latest concept of the species forming that assemblage.

Such a sequence of events is, from the nature of the case, inevitable, though it leads to much difficulty both in tracing species and in assigning genera. The fact is that in some groups of the Oscininae there is no natural line or lines of demarcation; even the known forms merge into one another and share characters that should belong to different genera as originally defined; and when the world forms are really adequately studied there can be no doubt but that this tendency will be increased.

It will follow that it is quite possible that the author may have assigned species to definite genera which, in the opinion of more experienced students, should be placed elsewhere. For this reason the descriptions are often made a little fuller than would be necessary to enable one to discriminate between the species of a sharply bounded genus such as *Chyliza*. For the same reason it will be found that he has been compelled to place species in genera whose specification does not exactly meet the case. A good example is *Lagaroceras anomalum*; if the head were removed it would be impossible to distinguish this species from one of the described forms of Becker's *L. megalops*; but the antenna and vertical triangle are both considerably at variance with the forms described as characterizing the genus. Wide interpretation of generic limits is unavoidable in this family, for if definite and fixed generic characters were to be adhered to, the family would mainly consist of monotypic genera.

The author hopes to be able to continue with some other of the Acalyptrate families if time and opportunity permit.

Note.—To save space certain abbreviations will be used. When describing the head the word "triangle" will refer to the fronto-vertical macula usually found there, though its shape varies greatly. The antennal joints will be referred to by number only—thus "3rd" will mean third joint of the antenna. In the case of the thorax the word "callus" will refer to the front thoracic callus unless qualified. In the wings the veins will be referred to by the old system of numbers as being more convenient and simple in this case; thus, "2nd" will mean the second long vein. Similarly, the costal segments will be referred to by the numbers of the long veins that end there—thus "2 to 3" means costal distance between ends of second and third long veins measured on costa.

*CHLOROPINÆ.**PACHYLOPHUS*, Loëw.

The following species were in the collections:—

- P. lugens*, Loëw. Cam. Coll., Durban (*F. M.*).
P. splendidus, Ad. Cam. Coll., Durban (*F. M.*).
P. proximus, Ad. Cam. Coll., Durban (*F. M.*).
P. fossulatus, Ad. Cam. Coll., Durban (*F. M.*).
P. varipes, Ad.; a very pale-legged form. Cam. Coll.,
 Durban (*F. M.*).

In addition, there were many specimens included in the ordinary black-vertexed section. To this section belongs

Fig. 1.



Fig. 2.



Fig. 3.



Fig. 1.—Wing of large form of *P. frontalis*.
 Fig. 2.—Wing of small form of *P. frontalis*.
 Fig. 3.—Wing of *P. frontellinus* (?).

Loëw's species *P. frontalis*; Becker, in his monograph, only recognizes as valid that single species in the section with black triangle, prominent head, and pale femora. He sinks as synonyms both Bezzi's *P. tellinii* and Speiser's *P. frontellinus*. As regards the first, he makes out what is apparently a good case, but gives practically no reasons for the second. If one studies the fairly long series in the Cam. Coll., it can be seen at once that there are two quite definite venations present, shown in figs. 2 and 3. The species with the cross-veins fairly apart has a dullish frons, with the triangle little marked, but a raised shining black central

line, and this form agrees quite well with the description of *frontalis*. The species with the more approximate veins is a little smaller and its vertical "triangle" is more shining; the raised central line tends to be multiple—in fact, it agrees very closely indeed with Speiser's description of *frontellinus* (Kilimandjaro Meru Exp., Diptera, x, p. 198). In the Bur. Coll. are specimens still more robust than the first species, with venation as in fig. 1 and with rather more glassy wings, but otherwise practically identical with the first series.

It appears best to consider the first and last sets of specimens as belonging to *frontalis*, and the other to *frontellinus*; in none of the published descriptions is any figure of the venation given.

P. frontalis. The large form: Bur. Coll., Durban (*L. Bevis*).

The smaller form: Cam. Coll., Durban (*F. M.*).

P. frontellinus. Cam. Coll., Durban (*F. M.*).

Three species in the collection belong to the smaller section of the genus with a pale vertical triangle. Hitherto there are described but two species in this section (Becker, II., p. 388). Neither of these species accords with the specimens in the collection, and hence they must be considered new.

Pachylophus lituraticrus, sp. n.

This species belongs to Becker's section with pale legs and triangle (II. p. 387).

Head (top view):—Vertex nearly as broad as twice the visible eye-breadth, somewhat transversely concave on the front, bright dullish yellow; the triangle is shining orange without furrows &c., extending not quite to the frons, with a rounded darkened tip, very slightly concave sides, and with the vertical base just less than the eye-distance; the ocellar spot black. In profile the angle between the vertical and facial tangent-planes is a little less than 90° , the frons being just visibly prominent. The pale yellow cheeks are about $\frac{2}{3}$ the depth of the 3rd joint; the latter is quite normal, yellow except for the part below aristal insertion; the latter is black and of usual form. Palpi yellow. Hind head orange; a darkening behind the ocellar spot, and a pale spot each side just at the top angle of the eye, on which the tiny vertical bristles stand.

Thorax: dorsum elegantly striped; along the middle a broad stripe of reddish brown bordered by pale narrow

stripes, which are less covered with the tiny bristles clothing the rest of the dorsum—hence these pale stripes are made more conspicuous; beyond these down to the notopleural suture the dorsum is again reddish brown, though less intense; callus with a black central spot surrounded by yellow; pleura orange, shining. Scutellum with its middle third occupied by a bright yellow longitudinal stripe, bounded by black, though the extreme hind angles are pale; terminal crossed bristles just at the end of the black stripes; the surface is very faintly and sparsely striate.

The venation is exceptional; the cross-veins are much approximated, being separated by a distance rather less than $1\frac{1}{2}$ times the length of the hind cross-vein. The discal cross-vein is a little beyond the costal ending of the 1st; wings clear, with pale orange veins. Halteres white.

Legs all yellow except for an infuscation on the front tibia and tarsus and on the last joints of the other tarsi. A very striking and constant character is a darkened "brand" on the back of the hind tibia; this brand occupies about $\frac{1}{3}$ the length of the tibia. Similar structures can be just seen on the legs of other species, but are not coloured in them; they also occur in other Chloropid genera.

The abdomen is the same colour as the thorax, the margins narrowly paler, and has a well-marked interrupted darkened middle line.

The intensity of the reddish colour of the insect varies to a fair extent.

Length (excluding antennæ) nearly 3 mm.

A long series in Cam. Coll., Durban (*P. M.*).

Note.—It is just possible that this species is the same as Becker's *P. contractus* (II. p. 393); but it is unlikely that so careful an observer should not mention the "brand" or the relation of the cross-veins.

Var.—There is a single specimen with a slightly paler triangle and no visible dark brand. This is in the Bur. Coll., Manganallur, Tangore. Although the localities are so far apart, the insect is not specifically separable.

STELIOCERUS, Beck.

S. lepidopus, Beck. Cam. Coll., from Chirinda Forest (*G. A. K. M.*).

Steleocerus nigricornis, sp. n.

This species is next to Becker's *S. longicollis* (II. p. 401), but differs as follows:—

The halteres are grey, not white; the jowls are larger, about $\frac{1}{3}$ the depth of the third antennal joint; the tongue is pale, not black; the antennæ are all deep black, not red; legs a little paler; wings more normal, with rounded anal angle.

Size $5\frac{1}{4}$ mm.

Cam. Coll., Durban (F. M.).

S. ensifer (?), Thoms.

A single specimen agrees fairly with Thomson's description (Eug. Resa, p. 605), but it is possible that we have another species here. The legs are quite pale; the frontal triangle is not all yellow, but is very much suffused with shining brown, which does not, however, entirely cover the triangle, but occupies the base and shades off forward. One cannot be sure of the identification from this single specimen.

Bur. Coll., Mysore.

There is an immature specimen in Bur. Coll. from Coimbatore, Madras, which is near *S. formosus*, Beck.

Steleocerus quadrivittatus, sp. n.

From the Chirinda Forest, S. Africa, we have a few specimens of a species of the *ensifer-tenellus* group.

Head (top view):—Frons yellow and dull, the triangle equilateral, with nearly straight sides; basally it practically touches the eyes and extends by a sharp point right to the front; it is suffused with shining brown, which leaves narrow yellow side-lines and broader boundaries on the hind head, where the black part of the triangle's base extends as a broad stripe down the hind head. Side view: outline fairly circular, the frontal and facial tangent-planes making about 90° , and the hind jowls large; eyes oval, oblique forwards, with narrow lower jowls less than half the width of 3rd; all the side is whitish yellow. Antennæ rather large, the 3rd projecting backwards a little, so as to be a longish oval with axis parallel to body-axis; it is yellow, but darkened dorsally; 2nd yellow, arista normal. Face, palpi, &c., all pale yellow.

Though there are but few specimens, the thorax varies somewhat in amount of darkening; dorsum with a broad

black central stripe, sometimes getting browner behind, and extending forward right on to the prothorax; each side is a grey pollinated line of ochreous tone, which is moderately distinct till just before the scutellum, where it suddenly becomes very marked and forms an elongate spot at each side of scutellar base; similarly in front, just at level of calli, it again forms bright long spots; beyond these grey lines the dorsum is as the mid-line, but is more darkened in front of the cross-suture, in one case quite black there. Calli shining, rather orange. Pleura all somewhat shining orange, with brownish boundaries to the sclerites; the black spot over middle coxa may or may not be present. Scutellum darkened orange, in one case paler in centre; terminal bristles long and crossed, and a few smaller marginal ones.

Wings clear with brown veins, 2nd ending about $\frac{3}{4}$ down costa between 1 and 3. Halteres white, with orange stalks.

Legs orange, with front tibia and tarsus a very little darkened.

Abdomen yellowish at sides, the dorsum forming a broad darkened continuous stripe.

Size (ex. antennae) just under 2 mm.

Cam. Coll., Chirinda Forest, S.A. (*G. A. K. M.*).

The second species is represented by but a single specimen, but it is very distinct from all the others.

Stelocercus flavipes, sp. n.

Head (top view):—About $1\frac{1}{4}$ times as long as broad; from vertex to the slightly prominent frons it is all bright yellow; the triangle is very shining, especially along its concave side boundaries; these are slightly depressed, and the hair-lines on them are exceptionally well marked; the sharp-pointed apex projects between the somewhat swollen antennal pits; basally it does not quite occupy the whole vertical breadth; eye-margins narrowly silvery, especially in front; ocellar circle black; hind head absolutely pale except for two excessively narrow dark lines from vertex. Side view:—The angle between frontal and facial planes is about 75° ; antennae all quite pale yellow, except that the 3rd joint is orange just at the insertion of the black arista, which is more elegantly and regularly haired than in the other species. Jowls pale yellow; palpi pale. In front the mouth-margin is seen to be very narrowly darkened.

Thorax reddish orange, with the following greyish pollinated stripes:—Centrally a short narrow one extending but

a little distance on the disc, each side of this another which runs to the outer angles of the scutellum, diverging as they go; beyond these the orange is very slightly suffused with grey; calli shiny orange, pleura the same. Scutellum blackened orange, slightly punctate.

Wings yellowish, with orange veins; small cross-vein just perceptibly beyond the costal ending of the 1st; hind one about 3 times its length from the former, and with its distance from the lower end to the 5th vein-ending about $1\frac{1}{2}$ times the distance apart of the cross-veins.

Halteres quite white, with yellowish stalks.

Legs entirely yellow, with no darkening at all.

Abdomen all darkened orange, with very narrow palish hind margins.

Size nearly 3 mm.

Cam. Coll., Mozambique (F. M.).

Steleocerus latiseta, sp. n.

There is a single specimen of a very distinct species.

Head (top view):—Frons dull orange, lighter over antennæ, the triangle is remarkable in form; basally it just does not touch the eyes; the margins are formed by raised straight ridges; about halfway a sudden diminution in breadth occurs, so that the side boundaries at that point are suddenly shifted inwards; the space between these forward parts of the ridges is necessarily a little depressed, but down the centre runs a very fine raised ridge, which goes to the front of the head to just behind where the side-ridges meet in a slightly rounded curve; the whole is shining bluish black except the extreme tip, over which the frontal orange runs; ocelli bright chestnut. Back of head entirely black. Side-view:—Eyes very large, only leaving very narrow lower and fairly narrow hind orange jowls; the orange frons is just visible, the 3rd is orbicular and all orange; the arista is a little broader than usual and tapers to a fine point.

Thorax: dorsum dullish black, pollinated more and more strongly with brown pollen towards the scutellum; the pre-scutellar depression is present, but is not sharply demarcated from the rest. Scutellum as thorax, with divergent bristles. The calli and an area below all orange, the pleura shining dark brown, with a few lighter areas interspersed.

Wings clear, with brown veins, but with a faint smoky cloud between 3 and 4 extending nearly to level of costal ending of 2; the second vein long, as in *lepidopus*.

Halteres with white knobs.

Legs entirely yellow, except that the last two joints of the very slightly dilated front tarsi are suffused.

Abdomen all rather shining brownish black.

Size (ex. antennæ) 2 mm.

Cam. Coll., Chirinda Forest, S.A. (*G. A. K. M.*).

MEROMYZA, Meig.

M. capensis, Loëw.

There is a long series in Cam. Coll. which shows the very considerable variation in abdominal and other infuscation that occurs in this species.

Cam. Coll., Durban (*F. M.*).

Cam. Coll., Salisbury, Mashonaland (*G. A. K. M.*).

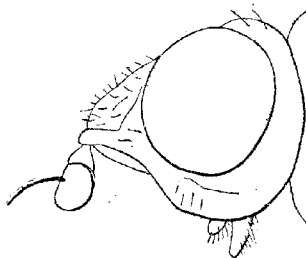
Bur. Coll., Zomba, Nyasaland (*H. Stamus*).

EURINA, Meig.

Eurina oculata, sp. n.

There are two females in the Bur. Coll. which belong to this genus, but do not fit with any of the hitherto described species. The eyes are larger than in most, being more of the proportion shown by Meigen in S.B. vi. tab. lv. fig. 10, though the frons is less protuberant.

Fig. 4.



Eurina oculata, $\times 40$.

Head (top view):—Breadth nearly twice the distance from vertex to tip of frons; vertex concave; eyes prominent and practically bare; frons ending in a rounded cap containing the antennal bases. The colour of frons &c. is pale brown, dull; the rather darker triangle is nearly equilateral, more shiny, with base about $\frac{2}{3}$ vertical cross-breadth;

it ends in a very sharp raised ridge extending to the antennal cap; the boundary is formed by two darkened furrows bordered interiorly by two or three smaller parallel furrows; the frons itself (along eye-margins exteriorly to the triangle) has two very deep and broad furrows extending along the sides of the triangle from the vertex to end of the triangle; the minute pairs of vertical bristles stand at the beginning of these furrows. Ocelli brown, with tiny ocellars each side of the front ocellus. The hind head is darkened behind the ocellar triangle except along the actual vertex, which is yellow in two long confluent spots; the rest of hind head is brownish yellow.

Side-view:—The eyes are larger than usual, nearly circular, though slightly longer horizontally than vertically; the frons is hence less prominent than usual, the distance from antennal base to eye-margin being about 0.3 of the horizontal eye-breadth; the profile is less triangular than usual, there being well-marked horizontal jowls of about $\frac{1}{4}$ the eye-depth running into the frons by a concave face-line. The side is all brown-yellow except that the frons is there infusate. Antennæ black, small 2nd joint, 3rd elliptical; arista pale, but brown on the swollen basal joint. The pale face has a slight central swelling below antennæ. Palpi orange.

Thorax discally grey; two mid-stripes darker, extending from front to back, just separated till towards the scutellum, where they meet; alongside these stripes is an interrupted dark stripe forming a spot about the position of the cross-suture, and a longer continuing stripe extending to the scutellum; just above the side-suture is a similarly broken indistinct line; callus and pleura dull orange-brown. Scutellum orange, swollen, rounded in profile, hairy, especially on the margins, though no true bristles are present; it is darkened discally, with the orange showing through as a narrow stripe.

Wings normal, with thick veins; the thinning out of the 4th vein occurs suddenly at about $\frac{1}{3}$ of its length; cross-vein rather oblique. Halteres orange, with dark stalk.

Legs all orange-brown like the pleura, but slightly infusate dorsally on all the femora (less so on the front pair), on the tibiæ, and hind tarsi.

Abdomen somewhat flattened, dark brown, with sharp narrow whitish margins; ventrally all pale.

Size 4 mm.

Bur. Coll., Hagari, Madras Presidency.

Note:—"Feeding on leaf-parenchyma of grass."

LAGAROCERAS, Becker.

There appear to be five species that fall within the limits of this genus, of which at least three appear to be undescribed. They all agree with Becker's diagnosis very fairly, except that in two of them the 3rd antennal joint is broader than he figures for his type-species, and is more simply a long oval; there appears, however, to be no good reason for not placing them in his genus.

L. megalops, Beck.

There is a single specimen which agrees very fairly with Becker's description and figure; the dorsum is quite blackened all over, so that the three stripes are here confluent.

Cam. Coll., Mozambique (*F. M.*).

Lagaroceras anomalum, sp. n.

There are several specimens of a species which very closely resembles the above specimen in thoracic and abdominal colour, in the legs and general facies, but is a little larger. The differences are, however, marked and constant; they are (1) the triangle, which has a different form; it is not truly leaf-shaped, as in the generic diagnosis, but is practically triangular, with concave (not convex) sides; it extends to the front of head: (2) the antennæ are relatively shorter, though still nearly as long as the face; the third joint is not quite twice as long as the second and is about $1\frac{1}{2}$ times as long as broad; it is oval in form, with the upper tip sharply rounded.

Size (excluding antennæ) 3 mm.

Cam. Coll., Durban (*F. M.*).

Lagaroceras pulchellum, sp. n.

This is a fine handsome species of the *megalops* group.

Head (top view).—As broad as thorax; frons black except anteriorly just above the antennæ, where it is orange; the surface is dusted with greyish pollen and has many small hairs; the triangle is highly polished black and is of a pointed leaf-shape, the sharp stalk extending right to the base of the antennæ; the base is rounded and occupies a little over $\frac{2}{3}$ of the vertical breadth. The head-bristles are well marked; the back of the head is black. Side-view.—Profile a little more trapezoidal than normal, the line from

antennal base to mouth-edge nearly straight; jowls about equal in breadth to that of the 3rd antennal joint—they are silvery, as are the hind jowls. The antennæ are inserted just on the edge of the orange frons and are just about as

Fig. 5.

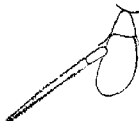


Fig. 6.

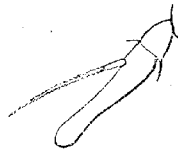
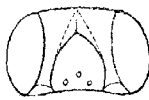
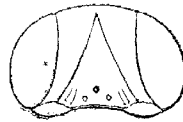


Fig. 7.

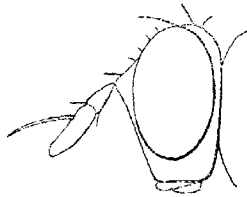


A.



B.

Fig. 8.

Fig. 5.—*Lagaroceras anomalum*, $\times 50$.Fig. 6.—*Lagaroceras longicorne* (?), $\times 50$.Fig. 7.—A. *Lagaroceras megalops*, $\times 35$. B. *Lagaroceras anomalum*, $\times 35$.Fig. 8.—*Lagaroceras pulchellum*, $\times 35$.

long as the face is deep; they are all darkish orange, except that the upper half and the tip of the 3rd joint are blackened; this joint is about $1\frac{1}{2}$ times as long as the 2nd, which

is itself rather unusually long; arista white and closely pubescent as usual, with the smooth basal joint yellow. The face is shining black, with silvery lines from the antennal bases to the mouth and with silvery lower eye-margins; palpi black.

Thorax: the dorsum is finely granulated; the general ground-colour is dark greyish, with the following black marks:—a broad median line vanishing about halfway, a very fine black line running down the centre of each of the rather obsolescent furrows; beyond this a broadish line from just in front of the callus to the side of the scutellum, interrupted by the grey ground where the cross-suture should be; last d. c. well developed; pleura shining black, with oblique row of three pale yellow spots—a triangular one just behind the humeral callus, a sloping one on the mesopleura, a horizontal one above the mid-coxa. Scutellum pale orange, nearly flat, hairless, with long crossed terminal bristles and small accessory ones beside the main ones and close to them.

Wings clear, with brownish veins; the venation is not quite as given by Becker for *megalops* (I., tab. iii. fig. 47); the 2nd vein is quite parallel to the 3rd all the way, and the distances between the ends of 2 to 3 and 3 to 4 are nearly equal.

Legs orange; femora progressively more infuscate from front to hind; last tarsal joints dark.

Abdomen entirely deep dull black, smooth.

Size (ex. antennæ) $3\frac{1}{2}$ mm.

Cam. Coll., Durban (*F. M.*).

To the section with dark and rather rugose scutellum belong two species. One of these will pass for *L. longicorne* of Thomson (Eng. Resa, p. 604). It agrees quite well with what would be a dark form of the species, though not so well with Becker's description (I., p. 108). The remarkable antennæ are even longer than may be inferred from the description; the thorax can be described as black, rather rugose, with three narrow, smoother, grey stripes; the scutellum like thorax, centrally black, with the sides orange.

It is possible that we have a new species here, but as there is but the single specimen, it is left provisionally in this species. Thomson's species was from China, this is from S. India.

Size (ex. antennæ) nearly 3 mm.

Bur. Coll., Coimbatore, Madras Presidency.

The following is a second species of this section ; it occurs also as a single specimen which, like *L. anomalum*, has a relatively stout antenna—in fact, the antenna is practically as shown in fig. 5 (p. 45).

Lagaroceras infuscatum, sp. n.

Head (top view):—Frons all palish ochreous brown, dull and black-haired, the triangle shining dark orange-brown and of peculiar shape; the basal part is about $\frac{2}{3}$ as broad as the vertical cross-breadth; it continues normally along the frons, but about midway is suddenly constricted, and then continues like a narrow spear-head to the antennal base; each side of the constricted point is a yellow raised spot on the triangle; the surface is somewhat variegated in striæ and the middle area is rather darker than the rest; just at the hind eye angles occur the usual pale spots carrying the vertical bristles. The f. o. b. small, but distinct. Hind head all black. Side-view:—Frons a little prominent, covering the antennal base, brown; face-outline nearly linear, if anything slightly concave, from antennæ to mouth. The total length of the antennæ is about equal to the face; the 2nd joint about half as long as 3rd, which is a little less than twice as long as broad; rounded oval in outline, all darkened except for a tiny spot of orange on the base of 3rd joint below; arista normal, white and pubescent, with smooth pale yellow base. Jowls, lower and hind, palish yellow, the former about half the depth of 3rd joint. Palpi black. The face is darkened with a narrow emarginate paler mouth-margin; the eyes have short silvery margins.

Thorax: dorsum black and finely punctate, with three very narrow grey lines. Scutellum flattish, similar to thorax, with a dark orange median line, two terminal and one adjacent smaller bristle each side. Pleura very shining brownish black, except for a yellow stripe just below the mesopleura.

Wings with venation similar to *pulchellum*, 2nd and 3rd quite parallel, but the cross-vein is slightly sloped backwards. Halteres white, with a brown stalk.

Legs orange, the femora progressively more infuscate from fore to hind pairs, the last tarsal joint darkened.

Size (ex. antennæ) $2\frac{1}{2}$ mm.

Cam. Coll., Durban (F. M.).

HAPLEGIS, Loew.

Haplegis nitens, sp. n.

A small form, considerably more shining than *H. tarsata*.

Head (top view) :—Entirely black and somewhat shining, even on eye-borders; the triangle fairly close to eye on vertex, extending with the usual straight sides to a sharp point over antennæ, excessively shining, with the usual shallow but sharp depressed middle trough; the bordering hair-rows very indistinct. Hind head all black. Side-view :—Lower jowls dull orange and very narrow; antennæ of normal form, 3rd black and round, 2nd bright orange; arista black and finely pubescent, the longish basal joints more orange. Face fairly silvery; tongue and palpi blackened.

Thorax all entirely shining black, including the scutellum, which has two longish end-bristles; the whole dorsum has a regular clothing of very fine brown hairs; the pleura is faintly orange in some parts.

Wings clear, normal in venation, brown veins. Halteres with almost white head.

Legs entirely clear orange, including front coxa and all the tarsi.

Abdomen shining black.

Size 2 mm.

Cam. Coll., Durban (*F. M.*).

ELACHYPTEREICUS, Beck.

E. bistratus, Beck.

Specimens from Durban, Cam. Coll. (*F. M.*).

CAMAROTA, Meig.

(*Modo, Oscinie*, Latr.)

C. angustifrons, Bezzi.

Specimens from Durban (*F. M.*) agreeing well with Bezzi's description.

METAPOSTIGMA, Beck.

M. sauteri.

Specimens in Bur. Coll. from Coimbatore, Madras.

CHALCIDOMYIA, de Meijere.

This genus was described in Tijds. v. Ent. (vol. liii. p. 156) as a *Drosophilid*, the error being due to the insect possessing a remarkable bipectinate arista. Becker redescribed it in its

proper family as *Hemisphærisoma* (III., p. 47). The synonymy was given by de Meijere in *Tijd. v. Ent.* (vol. lvi. p. 571). In both cases the specific name selected for the type-species had been *politus*, but for some reason de Meijere changed it to *beckeri*, though both types were the same species.

C. polita, de Meij.

Specimens in Bur. Coll. from Taliparamba, Malabar, with the note:—"In ginger-stems attacked by *Dichocrocis*."

CHROMOPTERUM, Beck.

Chromopterum lacteiventre, sp. n.

This species has the pubescent arista of the Indian species *C. pubescens*, Becker (III., p. 82), but its facies is that of the African *C. delicatum*, Becker (II., p. 413).

Head (top view):—Frons almost entirely covered by the brilliant shining black "triangle," which has its sides contiguous with the eyes and a rounded front margin reaching to the antennal base; its sides converge slightly to the front; the only part of the frons left uncovered by it are two small, dull orange, triangular patches each side in front; the surface is broadly and shallowly depressed; the ocellar hump is slightly raised and carries chestnut-coloured ocelli. Side-view:—The semicircular eyes cover the whole, projecting beyond the face and leaving practically no lower jowls and only a small hind eye-border, which is shining black, as is the whole hind head. The antennal 3rd joint is almost orbicular, just a little longer than deep, orange on lower half, blackened on top; arista inserted basally, hair-like except for the small pale basal joint, finely pubescent; 2nd joint yellow. Face darkened orange; palpi black.

Thorax (including scutellum and pleura) all shining black, the dorsum just before the scutellum and the scutellum itself very lightly dusted with orange pollen; the rounded and slightly swollen scutellum with moderately long slightly divergent end-bristles and a few accessory side-hairs.

Wings with venation as figured by Becker (II., tab. xiii. fig. 10), but the blackening is different; the front blackening is confined to the first part of first vein, the space between it and where the auxiliary vein would be (like a long stigma), and the thickened black costa itself, from which a faint suffusion runs on to the neighbouring cell; the end spot is smaller and discrete, it touches the costa midway between

the ends of 2 and 3, but does not extend to the end of wing or down to vein 3.

Halteres with ivory-white heads.

Legs mainly orange, all the coxæ black and all femora broadly ringed with black.

Abdomen: dorsum flattened, a little longer than broad, and tapering in outline from the base; it is of a quite unique colour, being all suffused with a dense milky-blue glaze; the last segment is considerably longer than the others; beneath, the abdomen is orange; the last segment, which is bent under, is all shining black.

Size about $1\frac{3}{4}$ mm.

Cam. Coll., Peradeniya, Ceylon (*J. C. F. Fryer*).

Ors, Becker.

O. madagascariensis, End.

A specimen in Cam. Coll., Durban (*F. M.*), differs from the ordinary form only in the femora being somewhat darkened.

O. callichroma, Loew.

There are two specimens of this species—the one in Bur. Coll. from Nyasaland, in which the abdominal cross-bands are rather weak and indefinite. The other is a very bright and shining form, which might be taken as a subspecies. It is a little larger, and the "triangle" covering nearly all the frons is very deep excessively shining black instead of being shining brown. The abdominal markings are also very clear and distinct; they consist of the following on the yellow background:—1st segment with very short central bar; 2nd arched bar with the springings situated basally; 3rd broad, only leaving narrow hind margin yellow; 4th median, of half total breadth of segment; the pointed 5th has a narrow basal band.

A specimen in Cam. Coll., Durban (*F. M.*).

Ops nigra, sp. n.

The whole of head and thorax entirely shining black, except for the orange antennæ and bright yellow scutellum. The vertical triangle does not cover the whole of the frons, but leaves eye-margins narrowly widening right from the vertex.

Wings quite normal, clear.

Legs orange, with coxa black ; femur very dusky except at tip. Knobs of halteres whitish orange.

Abdomen orange, with dark bands somewhat similar in form to last species, but all of them broader in proportion and less well demarcated.

Size 2 mm.

Cam. Coll., Mozambique (*F. M.*).

CHLOROPISCA, Loëw.

There are two single-specimen species—one resembling *obscura*, but with a rounder head, the other like a true *Chlorops*, but with somewhat flattened scutellum. It is not advisable to describe from these single specimens.

CHLOROPS, Meig.

C. contribula, Loëw.

Cam. Coll., Durban (*F. M.*).

C. levigata, Beck.

Cam. Coll., Durban (*F. M.*).

Chlorops zeylanica, sp. n.

There is one species which will not accord with any of Becker's species in the Indian fauna. It has a somewhat exceptionally prominent head (see fig. 9) and belongs to the section with fine white arista.

Fig. 9.

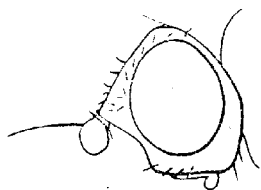
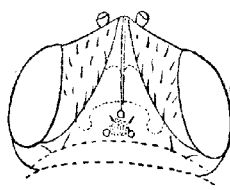


Fig. 10.



Chlorops zeylanica, $\times 30$.

Head (top view):—Frons (fig. 10) dull pale ochreous yellow covered with black hairs; the triangle very large, with its boundary well defined nearly up to the vertex, but there less so ; it extends to the extreme front, with slightly

concave sides bordered with hair-lines, and it is the same colour as the frons but shining and suffused across the middle with pale brown, as shown by the dotted boundary-line in the figure; the ocellar spot is black; a very distinct but narrow furrow runs from front ocellus right to edge of frons. Hind head broadly black, with pale yellow bordering stripes starting from the vertical bristles. Side-view as in fig. 9; all yellow, the haired frons more orange, rest quite bare except for a few oral hairs. Antennæ with yellow basal joints, deep black orbicular third; arista white, basal joints a little suffuse, pubescence very fine. Face all pale yellow; palpi pale, but just perceptibly infusate outside at tip; tongue yellow.

Thorax: dorsum moderately shining yellow, with black hairs; three broad black stripes, the middle one beginning on neck and extending to scutellum, the side ones abbreviated in front but meeting the middle one behind, so that they form an almost uninterrupted band on hind dorsum; small side-lines above the wings run into the main pair; humeri pale yellow. Pleura pale yellow; a shining oval black spot on the lower front angle of the mesopleura, the usual black triangle over the middle coxa, and a smallish black oval spot over the hind coxa.

Wings normal, clear, thick-veined; in one of the two specimens both the hind cross-veins are broken in the middle. Halteres bright whitish yellow, with darkened stalk.

Legs entirely yellow except that the front tarsus and last joints of the others are very faintly infusate.

Abdomen: dorsum all brown-black, slightly shining, the hind margins of all segments but last very narrowly yellow, the last broadly so; venter paler.

Size (ex. antennæ) $3\frac{1}{2}$ mm.

Cam. Coll., Peradeniya, Ceylon (*J. C. F. Fryer*).

PARECTECPHALA, Beck.

Parectecphala varifrons, sp. n.

A species in the Cam. Coll. is best assigned to this genus; the triangle is rather longer than normal according to the descriptions of the known species.

Head (top view, fig. 12):—Frons about $2\frac{1}{2}$ times as broad as one eye and about $1\frac{1}{2}$ times longer than broad, projecting about $\frac{1}{3}$ its length beyond a line touching the eyes in front; eye-margins parallel, the projecting forehead narrowing a little and ending in a broad pointed tooth overhanging the

antennal pits; frons bright dull orange, with small scattered black hairs; the triangle has its base about $\frac{2}{3}$ the breadth at vertex; the bounding lines are nearly straight, a little raised, very narrowly yellow, and meet just beyond the level of the eyes; they continue nearly to the front in a shining yellow stalk; inside these narrow lines the triangle is mainly shining chestnut, but is variegated by lighter colours,

Fig. 11.

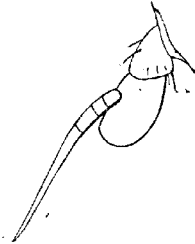
*Parectecephala varifrons*, sp. n., $\times 50$.

Fig. 12.

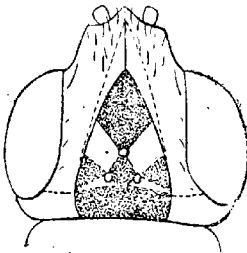
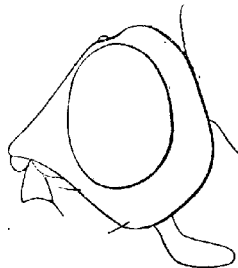


Fig. 13.

*Parectecephala varifrons*, sp. n., $\times 40$.

so that the most prominently visible chestnut part is a rhombus extending from the triangle's tip to the front cellus; this area is also very shallowly hollowed out; the lighter parts consist of (1) a pair of oval dull brightish yellow spots each side of the ocellar area, and extending thence right to the sides of the triangle; (2) two more orange and

more shining spots extending from hind ocellus to the outer angles of the triangle. The hind head is orange except for a large black patch extending from the base of the triangle. Side-view (fig. 13):—All pale whitish yellow, the side of frons orange; eyes very nearly circular; jowls about depth of 3rd; face somewhat concave; antennæ as fig. 11, but the arista for its last $\frac{2}{3}$ is very faintly white pubescent, not bare as figured, 3rd joint orange with blackened tip; tongue and palpi yellow. Face whitish, unkeeled, but depressed, the actual facial ridges being marked with a narrow pale grey line; antennal pits well marked with dark shining chitinous edges.

Thorax: dorsum dull palish orange; a broad black central stripe from neck to end of scutellum—this is very intense up to about the middle of the dorsum, then gets much fainter, till it is very faint on the scutellum; each side is another uniformly black line, rounded and abbreviated front and back, and diminishing that way in breadth; below is another very thin blackened line extending forward from just above the wing for about $\frac{2}{3}$ the pleural length. Scutellum (as above) suffused centrally, sides orange, not flattened, a little hairy, pair of terminal bristles; metanotum darkened; the pleura all rather shining pale yellow, with a small elongate spot.

Wings normal, clear, with brown-orange veins, the distance between cross-veins about equal to the last part of 5th; halteres with whitish knobs.

Legs long, all yellow except for the last two darkened tarsal joints.

Abdomen shining brownish orange, with very narrow pale segmental margins; venter paler.

Size $4\frac{1}{2}$ mm.

Cam. Coll., Durban (*F. M.*).

PEMPHIGONOTUS, gen. nov.

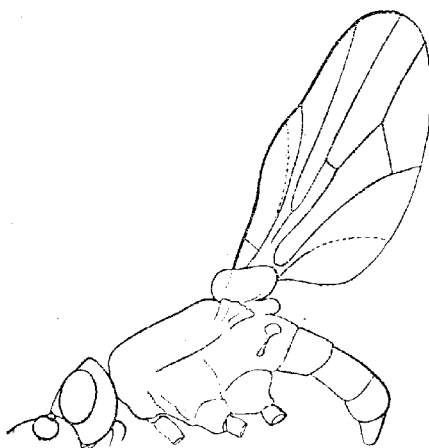
In the Bur. Coll. are three specimens (1 ♂, 2 ♀) of a remarkable insect from Melville Island which exhibits marked sex-dimorphism.

Characters common to both sexes:—Texture horny, macrochaetes quite absent, though body hairy; scutellum very large, swollen, standing in profile well above the thoracic level (see fig. 14), with a flattened area of different texture; abdomen oval and flattened; wings with very long discal cell (see fig. 14), the auxiliary and anal veins just visible as "shadows" of veins; legs long; antenna like that

of a true *Chlorops*; the triangle narrow and ill-defined, with a better-defined narrow central line, only differentiated by shine from the rest of frons.

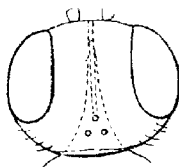
The male has a remarkable arch in the first part of the costa, which carries a fringe of very long hairs; the mid-femur and tibia are also clothed with abundant long tangled hairs.

Fig. 14.



Pemphigonotus mirabilis, $\times 12$.

Fig. 15.



Pemphigonotus mirabilis, $\times 22$.

Pemphigonotus mirabilis, sp. n.

The insect is all red-orange, slightly darkened in various places except where otherwise mentioned.

♂.—Head (top view, fig. 15):—Frons bare, dull except for the very narrow redder mid-line extending from ocellus to forehead and the narrow ill-bounded main triangle; no eye-margins; hind head hairy at upper corners behind eyes. Side-view (fig. 14):—Antennæ and palpi clear yellow; arista hair-like, pale; tongue fleshy and hooked at tip. In front the face is wide, with no keel except a tiny bar between antennæ; margin of mouth arched.

Thorax bare on dorsum, which is flattened and dull except for a central shining line extending to the shining base; the sides above the notopleural suture and all the pleura are abundantly clothed with long pale hairs. Scutellum enormously swollen both sideways and upwards, smooth except for an extraordinary flattened area on the disc, which is slightly dimpled; the base towards thorax has two large blackened areas with a pale line between; it is hairy, with pale hairs, which are longest and regular on the margin; notopleura smooth.

Wings as fig. 14, the costal elevation from base to 1st vein with a row of long, dark, silky hairs; the whole surface much suffused except a rather narrow lower margin from axillary angle to near the end of the 5th, and again from beyond that end to just across the 4th.

Halteres practically white.

Legs long, hairy, all pale orange except for a slight suffusion on the front tibia and the darkened tarsi; all the tarsi somewhat swollen. The middle femur and tibia with abundant long pale hairs.

Abdomen flattened, long-oval, the maximum breadth being about twice the thoracic breadth.

The ♀ differs as follows:—Thorax not so dull and not flattened; wings with no costal elevation, the whole costa being very gently curved in a continuous manner; no long hairs on costa; no long hairs on middle legs.

Size about 5 mm.

Bur. Coll., Melville Island, N. Australia (*G. F. Hill*).

BATHYPARIA, gen. nov.

Becker describes a genus *Euryptaria* (III., p. 84) which occurs in Formosa; it has very deep jowls, quadrate 3rd antennal joint, and is covered with white hairs. Among the Durban species there are several specimens of a very handsome small Chloropid that have the above characters,

especially the bright silvery clothing, and even a faint central wing-cloud, in common with Becker's species; but they differ greatly in that the eyes are long-oval and the antennæ are smaller. The thorax in the species represented is black and not striped, and scutellar bristles are present. They must form the African equivalent of the Asiatic genus.

Head (see figs. 16 & 17):—The facial and frontal tangent-planes meet at about 120° ; eyes long-oval, with axis nearly upright; jowls very deep, about half the depth of the long eyes; antennæ nearly as long as face, with a practically rectangular 3rd joint about twice as long as broad, and a very fine, slender, bare arista, thickened basally. Frons parallel-sided, with a long rather narrow triangle from vertex to front only just differentiated by its extra shininess from the rest of frons. Wing-venation as fig. 18, the 3rd and 4th veins just not reaching the edge.

The whole insect is covered with brilliant shining white hairs even on the frons; these are very stout and bright on the thorax and head, but less so on the abdomen. Unlike *Euryparia*, there is a pair of scutellar bristles inserted in the same manner as in *Ops*.

The palpi are quite peculiar, being rather stout, long, and spoon-shaped.

Bathyparia præclara, sp. n.

Head (top view):—Chestnut-brown, the triangle more shining; the silvery hairs along the triangle's border bend across it; eye-margins broad and very silvery; the verticals and ocellars white; hind head all black except just on vertex behind ocelli, where is a long yellowish stripe along the vertical ridge. Side-view:—Similar in colour, the broad hind eye-margin very silvery, as is the hind jowl. Antenna slightly darkened brown; arista pale at base. The palpi are long, spoon-shaped, and silvery grey; tongue dark. Face the same brown colour, side-ridges well developed; no median keel, so that the antennæ nearly touch basally.

Thorax: dorsum, meso- and sternopleura all shining black and punctate, covered with bright silvery-white hairs arising from the punctures; the rest of pleura bare. Scutellum bright yellow, with approximated pale terminal bristles and silvery hairs like thorax. Notopleura black and dull from very faint shagreen.

Wings (see fig. 18) clear, with brown veins; in several specimens the central part is very faintly tinged with brown. Halteres pale yellow.

Legs long, with slightly dilated tarsal joints, all covered with the fine white silky hairs; front pair all black except for orange trochanter and knees; middle with orange trochanter, black femur, the rest nearly white; hind with dark orange trochanter, femur black with pale knee, tibia pale

Fig. 16.

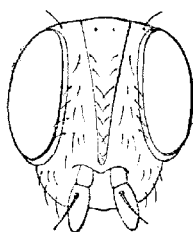


Fig. 17.

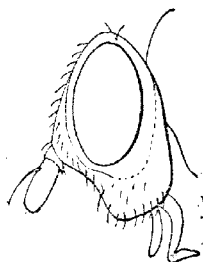


Fig. 18.

*Bathyparia præclara*, $\times 40$.

and more or less darkened about the middle, tarsi nearly white.

Abdomen smooth, shining black, the silky hairs evident but sparse and fine, a little longer at upper angles.

Size $2\frac{1}{4}$ mm.

Cam. Coll., Back Beach, Durban (*F. M.*).

III.—*Some Systematic Notes on Melolonthine Coleoptera*.

By GILBERT J. ARROW.

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MR. L. PÉRINGUEY, in his "Catalogue of the Coleoptera of S. Africa" (Trans. S. Afr. Phil. Soc. xiii. 1904, p. 174), puts at the head of the genus *Sparrmannia* a species which he calls *vertumnus*, Pall. (with the names *alopez*, F., and *brunnipennis*, Cast., as synonyms), mentioning a typical form with pale testaceous colour as inhabiting the Karroo region, and a form with "light" (apparently meaning dark) chestnut elytra in Namaqualand, Bushmanland, and Damara-land. The recent Catalogue of Dalla Torre adopts this synonymy, but separates as a variety the dark form *brunnipennis*.

Dr. H. Brauns has lately sent a series of this dark form, which he has found in abundance in the Uniondale district of Cape Colony, while the light form is equally abundant in the Willowmore district, only 42 miles to the south, but separated by the range of the Zwaartberg running from west to east across the continent. Examination has proved that the two forms are quite distinct, and Fabricius's description shows that it is the dark form which is the true *S. alopez*. It was Fabricius himself who, in his Syst. Eleut. ii. p. 163, identified this insect with the *Scarabeus vertumnus* of Pallas, but with strange carelessness, for the latter is a Russian species, apparently belonging to the genus *Rhizotrogus*.

The light-coloured *Sparrmannia*, described at length by Péringuey, is therefore without a name, and I propose to call it

Sparrmannia flava, sp. n.

In addition to the pale-coloured elytra, this species differs from *S. alopez* in their more distinct and regular puncturation, in the longer tarsi of both sexes, and especially in the longer middle tarsi and more dilated hind tibiae of the male. The aedeagus is figured by Péringuey. That of *S. alopez* is much shorter and blunter. Dr. Brauns states that, while *S. flava* occurs together with *S. alopez* north of the dividing range, he has never seen the latter south of the mountains, and that no specimens of intermediate coloration are found. *S. flava* generally appears at Willowmore towards Christmas time, while *S. alopez* is later, generally appearing in January

and February. Both are nocturnal, and hide in loose soil during the day.

There is another closely similar species, of which specimens are probably included amongst those enumerated by Péringuey, and which I have wrongly determined as *S. vertumnus* in Denkschr. Med. Nat. Gesellsch. xiii. 1908, p. 438. I now call it

Sparmannia similis, sp. n.

Pallide flava, capite, pronoto, scutello, pectore abdomineque longe et densissime lanatis. *S. flava* valde similis, sed clypeo paulo minus profunde exciso, elytris crebrius sed minus distincte punctatis tarsisque paulo minus elongatis.

Long. 22 mm.; lat. 11·5 mm.

Hab. S.W. AFRICA: Hereroland.

This has an extremely close resemblance to *S. flava*, but the elytra are finely and confusedly, instead of strongly and sparingly, punctured, the clypeus is acutely, but less deeply, notched in the middle, and its sides a little less rounded, and the tarsi, or, at least, the middle ones of the male, are not quite so long. The ædeagus of the male is drawn out into a tube just behind the orifice.

Upon p. 287 of his Catalogue already referred to, Mr. Péringuey recognizes two South-African species only of the genus *Asthenopholis*—*subfasciatus*, Blanch., and *crassus*, Arrow; but the species to which he has wrongly applied the latter name is evidently the true *A. adpersus*, Boh. (= *transvaalensis*, Brenske), and in *A. subfasciatus* he has included the quite distinct *A. minor*, Brenske. These four species may be distinguished as follows:—

- I. Scutellum well punctured; hind tibia little dilated at the end.
 - a. Scales of the upper surface long and hair-like. *subfasciatus*, Bl.
 - b. Scales of the upper surface short and broad. *minor*, Brenske.
- II. Scutellum smooth or almost smooth; hind tibia strongly dilated at the end.
 - c. Pronotum moderately covered with long setæ. *adpersus*, Bohem.
 - d. Pronotum closely covered with oval scales. *crassus*, Arrow.

A. subfasciatus seems to be confined to Cape Colony, *A. minor* to Natal, *A. adpersus* to Natal and the Transvaal, whilst *A. crassus* is known only from British East Africa. Brenske's species were determined for me by himself, and Mr. Péringuey has certainly determined them wrongly,

although he has had the assistance of type-specimens. The genitalia of the males are quite different in the three species he has united, notwithstanding his statement.

Mr. Péringuey has founded a genus *Euronycha*, but has not included in his Catalogue the genus *Triodonta*, of which many African species are known; and as the sole character by which he differentiates *Euronycha* (a feature of the male alone) is found in *Triodonta*, they must be considered the same.

The type of *Heterochelus gonager*, F., in the British Museum is the species called by Burmeister *H. longipes*, as Mr. Péringuey has recorded upon my authority (Trans. S. Afr. Phil. Soc. xiii. 1908, p. 698); but the quite different species to which the name *gonager* was applied both by Burmeister and by himself in vol. xii. of the above work remains without any available name. I propose to call it

Heterochelus melanopygus, sp. n.

The two following species of South-African Hopliini were described several years ago at Professor Poulton's request, but the descriptions have remained unpublished. The insects were amongst those collected more than a century ago by the African traveller Burchell, and now in the British and Oxford Museums. The data are taken from Burchell's notebooks in Professor Poulton's possession.

Gouna burchelli, sp. n.

Rather large, broad, sooty black, naked above, beneath thinly clothed with black hairs and a few white scales at the sides; head broad, rather convex and rugose above, clypeus short, not angulate but bilobed; prothorax rather broader than long, strongly contracted in front, front angles acute, hind angles very obtuse, surface finely punctate, with a faint longitudinal channel; scutellum small, almost semicircular; elytra broad, faintly costate, irregularly and inconspicuously punctured; pygidium (male) large, inturned, transversely punctate-rugose; legs (male) rather long, hind ones slightly thickened, unarmed, front tibiæ tridentate, the innermost tooth rather small and distant, all the claws single and minutely cleft, but those of the hind legs hardly visibly.

Length 9 mm.; greatest breadth 5 mm.

Locality. Burchell's two specimens (nos. 318 and 319)

were captured on the morning of Nov. 3, 1814, at Duyker River, in the south of Cape Colony, a little to the west of Mossel Bay.

The type is one of three specimens in the British Museum derived from the Pascoe Collection. There are also four from the Fry Collection and one from the Reiche Collection. All these, as well as the two brought by Burchell, are males, and the other sex remains still unknown. The species was wrongly identified with *Monochelus spinipes*, F., by Reiche, and has a general resemblance to that insect, but its structural characters are not those of *Monochelus*. They agree with those formulated by Mr. Péringuey for his genus *Gouna*, one of those created by the dismemberment of the old *Gymnoloma*. This dismemberment is very unsatisfactory, since by a process of elimination the original genus is left without tangible differential features at all. The present form, however, is nearly related to *Gymnoloma lineolata*, the type of *Gouna*, although much larger and broader. Its comparatively large size and sooty-black surface render it easily recognizable. I at first suspected that the absence of scales from the upper surface might be due to age; but the specimens are in general well preserved, and, as all agree in being smooth on the upper surface, they are evidently in their natural condition.

Dicranocnemus burchelli, sp. n.

Fuscous, with the elytra and legs reddish. Rather elongate, the thorax distinctly longer than wide and not gibbous. Clypeus parabolical, the front margin very slightly reflexed and with scarcely visible angles. Upper surface of the head uniformly finely rugose and pubescent. Prothorax moderately convex, the sides regularly rounded and converging forwards. Front angles acute, hind angles obsolete.

♂. Prothorax finely rugose and densely clothed with rather short tawny pubescence, which changes into scales at the posterior margin. The median sulcus is deep behind, but vanishes beyond the middle. The scutellum is clothed with elongate whitish scales and the elytra with round scales varying in colour from chocolate to pale yellow, the light ones forming a median longitudinal stripe which is broadest near the shoulder, a sutural stripe broadest at the apical end, and a quadrate patch between these. The pygidium and propygidium are densely covered with orange scales, with a darker band at the base of the former. The claws of the middle feet are without a basal appendage.

Length 5.5 mm.

♀. The prothorax is without a median sulcus. It is not finely rugose, but strongly punctured, and clothed with greyish hair, longer but less dense than that of the male. There are no scales. The elytra are more thinly clothed with decumbent setæ of an almost uniform tawny colour.

Length 4.5 mm.

Hab. Burchell's eight specimens, all of which are accounted for, were captured in flowers, five of them at Uitenhage (Nov. 28 and Dec. 1, 1813), and two between Kra Ka Kamma and Van Stade's River (Feb. 7, 1814), near (S.W. of) Uitenhage. Two from each locality are in the British Museum, but there is no means of associating these specimens with their precise data.

Types (♂ and ♀) in British Museum.

The description is based upon nos. 1303 and 1305 in the British Museum. The specimen numbered 1308 is rather smaller and shorter, and may possibly prove to be distinct; but it is most likely only an aberrant individual of the same form.

From the description, this species must be very nearly related to *D. hypocrita*, Péringuey, which has on each elytron two discoidal bands of pale scales coalescing at the middle, whereas only one is present in our form. In the female no pattern is traceable. A male and female of the species were compared by Mr. Guy Marshall and Mr. Péringuey with the Péringuey type at Cape Town and the ♀ (293) named *Heterochelus longipes*, Burm., the ♂ (294) *Dicranocnemus squamosus*, Burm. Both, however, show the form of front tibia distinctive of *Dicranocnemus*, while *D. squamosus* is characterized by a peculiar formation of the middle claws of the ♂ which is absent here. *D. burchelli* is one of the very numerous species of this group of which the sexes are quite dissimilar, so that, in the absence of sufficient evidence, they are frequently associated wrongly. The question has been settled for us in the present instance by Burchell. Four males and four females were taken by him, and of these one of each given to the British Museum were placed on the same pin, showing his conclusion that they belonged to a single species. It will be seen in the above description that, in addition to a difference of shape, the elytra of the male are decorated with orange scales, with a paler sutural patch and longitudinal stripe upon each, while the female is uniformly clothed with grey hair. Hence it is not surprising that, in the absence of direct evidence, they should have been assigned to different species, and even different genera.

Both generic and specific names of Blackburn's *Neolepidiota obscura* are redundant, the insect being a common Indian species, *Holotrichia serrata*, F., of which an old specimen in bad condition and of unknown origin unfortunately fell into Blackburn's hands. It is now in the British Museum.

I believe *Lepidiota bovilli*, Blackb., to be identical with *L. rothei*, Blackb. In spite of a careful comparison of his types, I am quite unable to detect the differences mentioned by him.

NEMATOSERICA, gen. nov.

Corpus nonnihil elongatum. Mesosternum haud productum, sat latum. Pedes graciles, tibia antica lata, bidentata, postica modice angusta, fortiter spinosa, tarsorum posteriorum articulo primo quam secundum duplo longiori. Ungues profunde fissi, parte interna brevi et lata. Antennae 10-articulate, clava (♂) quadri-articulata, longissima, lamellis aequalibus; (♀) triarticulata. Clypeus vix angustatus, margine antico reflexo, subtiliter sinuato, superficie anteriori haud lato. Oculi haud magni, remoti. Prothoracis latera postice sinuati, angulis posticis acutis. Elytrorum margines postici arcuati, ad suturam depressi.

Nematoserica caerulea, sp. n.

Cærulea vel viridi-cærulea, sericea, clypeo tibiis tarsisque nitidis, antennis nigris; modice elongata, convexa, capite, corpore subtus pygidioque pallide setosis, elytrorum lateribus fortiter nigro-setosis, clypeo parce punctato, margine valde reflexo, antice subtiliter sinuato; pronoto parvissime punctato, lateribus bisinatis, angulis posticis acutis, paulo productis, basi utrinque late impresso; elytris fortiter sulcatis, sulcis sat vage punctatis, apicibus separatim arcuatis, parte postica ad suturam depressa, corpore subtus opaco, grosse setoso; pygidio sat fortiter punctato. Long. 5.5 mm.; lat. max. 3.5 mm.

Hab. BORNEO (Sarawak): Puak (G. E. Bryant, April, May).

Type in the British Museum.

This beautiful little insect is chiefly remarkable for the length of the 4-jointed antennal club of the male, which is relatively longer than in any other species of *Sericinae* known to me. The four lamellæ are of equal length—at least five times as long as the foot-stalk—and little shorter than the elytra. The bright blue or greenish-blue colour is also, so far as I know, unique. The upper surface is silky and sub-opaque, with the clypeus alone shining, the margin of the

latter broadly reflexed, the front margin very gently excised, and a row of stiff bristles traversing the middle from side to side. The eyes are rather small and far apart. The lateral margins of the prothorax are distinctly sinuated in their posterior half, the hind angles a little produced and acute and the base impressed on each side. The elytra are sulcate and the sulci contain rather coarse but shallow punctures.

The genus is apparently related to *Teraserica*, which I do not know, and which has been described from the male alone, the antenna of which has the last four joints rather long but much less elongate than in the present insect. This has not the forehead narrow and the eyes very large and prominent, as in *Teraserica*. The strongly bisinuated sides of the prothorax and acutely produced hind angles are very characteristic, and another peculiarity which, so far as I know, is not found elsewhere is in the shape of the elytra. These are separately rounded at their hinder margins, with the sutural angles extremely blunt, so that a wide angle is formed and a considerable part of the abdomen exposed. The peculiar appearance, however, is chiefly due to the fact that this part of the elytra is strongly depressed along the suture.

IV.—*Descriptions of New Pyralidæ of the Subfamilies*
Epipaschianæ, *Chrysauginæ*, *Endotrichinæ*, and *Pyralinæ*.
 By Sir GEORGE F. HAMPSON, Bart., F.Z.S., &c.

[Concluded from vol. xviii. p. 373.]

(26) *Pyralis nigricilialis*, sp. n.

♂. Head and thorax creamy white tinged with purplish red, especially the tegulæ; antennæ purplish red; abdomen creamy white mixed with purplish red and dorsally banded with black except at base and extremity. Fore wing creamy white mixed with purplish red, the basal area suffused with black except at base of inner margin, the costa black, rather diffused towards apex; antemedial line defining the black area, creamy white slightly defined on outer side by purplish-red and black scales, excurved below costa; the medial part of costa with three white points; a round white spot defined by purplish red at upper angle of cell, another below the lower angle conjoined to a patch of confluent annuli beyond the lower angle, and another annulus on vein 1; postmedial line white defined on each side by purplish red, oblique to discal fold, there slightly waved; cilia black mixed

with some purplish red. Hind wing creamy white mixed with purplish red, the basal area suffused with black; an oblique slightly sinuous white antemedial line defined on outer side by purplish pink and some black scales; a white patch defined by purplish red and with purplish-red point in centre at lower angle of cell; postmedial line white defined on each side by purplish red and some black scales, waved; an interrupted purplish-red line with some black scales on it before termen; cilia black mixed with some purplish red. Underside purplish red; fore wing with the costa black with white points on it to beyond middle; hind wing with waved white postmedial line defined by deeper purplish red.

Hab. BR. E. AFRICA, Nairobi. (*Anderson*), 1 ♂; BR. C. AFRICA, Mt. Mlanje (*Neave*). 1 ♂ type. *Exp.* 16 mm.

(2c) *Pyralis trifoliatus*, sp. n.

♂. Head, thorax, and abdomen white mixed with purplish red, the antennae and tegulae purplish red, the abdomen irrorated with some blackish scales; sides of frons and palpi blackish, the latter with the extremities of 2nd and 3rd joints white; fore legs blackish, the tarsi ringed with white; pectus, mid and hind legs, and ventral surface of abdomen white tinged with red-brown. Fore wing creamy white mixed with purplish red and irrorated with a few black scales, the terminal area more suffused with purplish red; antemedial line white defined on each side by purplish red, slightly sinuous, a small white spot defined by purplish red on its outer side at vein 1; the medial part of costa black with four white points on it; a small white spot with purplish-red annulus at upper angle of cell, others below the lower angle of cell and on vein 1, and a trifoliate patch beyond lower angle of cell; postmedial line white defined on each side by purplish red, expanding at costa, excurved to near termen at middle, and ending at tornus; cilia fuscous black with a fine white line at base. Hind wing with the basal area white mixed with black and some purplish red, the medial area purplish red irrorated with black especially towards inner margin, the terminal area purplish red mixed with whitish and black; a slightly sinuous white antemedial line defined on each side by blackish; a figure-of-eight-shaped white discoidal spot defined by blackish and with black points in its upper and lower parts; postmedial line white defined on each side by blackish, waved, excurved between veins 6 and 3½; cilia fuscous black with a fine white line at base. Underside whitish suffused with red-brown; fore wing with the costa black with white points on it to beyond middle; hind wing with the postmedial line whitish and indistinct.

Hab. GOLD COAST, Kumasi (*Sanders*), 1 ♂ type. *Exp.* 12 mm.

(2d) *Pyralis atriparsalis*, sp. n.

♀. Head whitish suffused with purplish pink; thorax and abdomen purplish pink mixed with some whitish and strongly irrorated with black, the pectus, legs, and ventral surface of abdomen less strongly irrorated. Fore wing purplish pink mixed with some whitish and strongly irrorated with black, especially on basal area except towards costa; antemedial line strong, whitish defined on each side by black, oblique to submedian fold, where it is angled outwards, angled inwards at vein 1; a small blackish discoidal spot; a whitish patch on costal area towards apex, the whitish subterminal line arising from it, excurved to vein 3, then incurved; the termen purplish pink; Hind wing whitish tinged with purplish pink, the terminal half suffused with fuscous and irrorated with black towards tornus; a whitish postmedial line, excurved at middle and angled outwards at veins 3 and 2, then oblique to tornus; the termen purplish pink; cilia whitish, mixed with pink and black at tips. Underside whitish mixed with pink and fuscous; fore wing with the subterminal line indistinct, except the patch on costal area; hind wing with whitish postmedial line excurved at middle.

Hab. N. NIGERIA, Zungeru (*Macfie*), 1 ♀ type. *Exp.* 18 mm.

(3a) *Pyralis costinotalis*, sp. n.

♂. Head and thorax pale rufous; abdomen whitish suffused with red-brown; antennæ brownish; palpi and legs whitish suffused with red-brown. Fore wing rufous tinged with purplish red; antemedial line white defined on outer side by black, expanding into a wedge-shaped mark at costa, to which it is slightly incurved; the medial part of costa with alternating black and white points; a slight blackish discoidal spot; postmedial line white defined on inner side by blackish, expanding into a wedge-shaped mark at costa, then excurved and very slightly waved; a faint maculate brownish terminal band; a fine whitish line at base of cilia. Hind wing whitish suffused with rufous to the postmedial line except on costal area, the terminal area irrorated with brown; an oblique sinuous white antemedial line, joined at inner margin by the white postmedial line, which is excurved at middle, then slightly waved; a terminal series of small brown spots; cilia with a brown line near tips. Underside whitish suffused with reddish brown; fore wing with series of whitish and dark brown points on costa to the postmedial line; both wings with slight blackish discoidal spot and slightly waved whitish postmedial line defined on inner side by brown and excurved at middle.

(13a) *Pyralis rufibasalis*, sp. n.

♂. Head and thorax red-brown; abdomen white suffused with pale olive; legs red-brown; pectus and ventral surface of abdomen

whitish tinged with red-brown. Fore wing with the basal area rufous irrorated with red-brown, the rest of wing white tinged with olive; a small black discoidal spot; the curved postmedial line indicated by a faint olive shade on its inner side. Hind wing white tinged with olive; a diffused black patch on basal area; a small black discoidal spot; a diffused curved olive postmedial line. Underside white thickly irrorated with black-brown; hind wing with small black discoidal spot and diffused curved dark postmedial line.

Hab. GOLD COAST, Kumasi (Sanders), 1 ♂; S. NIGERIA, Ilesha (Hampfey), 1 ♂ type. *Exp.* 14-16 mm.

(13b) *Pyralis roseitincta*, sp. n.

♂. Head, thorax, and abdomen white tinged with pale red-brown. Fore wing white suffused with pale red-brown except towards the costa and termen; a curved white antemedial line with a patch tinged with rose-pink before it except at costa and inner margin; a slight red-brown discoidal spot; a sinuous white postmedial line with a rose-pink shade beyond it. Hind wing white suffused with pale red-brown except at termen; a curved white antemedial line; a white postmedial line excurved at middle and above inner margin and with rose-pink shade beyond it. Underside white tinged with rufous; hind wing with curved white postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (Neave), 1 ♂ type. *Exp.* 14 mm.

(16d) *Pyralis tyrialis*, sp. n.

♀. Head, thorax, and abdomen brownish ochreous, the head, thorax, and two basal segments of abdomen suffused with purplish crimson; palpi, legs, and ventral surface of abdomen brownish ochreous. Fore wing brownish ochreous suffused with purplish crimson and slightly irrorated with dark brown; a fine curved white antemedial line; a small black discoidal spot; a white postmedial line, excurved at middle; cilia white and blackish. Hind wing brownish ochreous strongly suffused with purplish crimson and irrorated with black; indistinct curved white ante- and postmedial lines defined by black scales; a blackish terminal line; cilia blackish. Underside ochreous suffused and irrorated with brown.

Hab. GOLD COAST, Bibianah (Sprell), 1 ♀ type. *Exp.* 18 mm.

(16e) *Pyralis phœnicealis*, sp. n.

♀. Head, thorax, and abdomen ochreous brown with a crimson band on 2nd segment of abdomen; palpi with some dark brown at sides; fore legs suffused with dark brown. Fore wing silky ochreous brown; the costal area irrorated with some dark scales, the medial part of costa with series of black points and the terminal part of costa glossy black; two indistinct crimson sub-

basal lines; a crimson and blackish point in middle of cell and small discoidal spot; a crimson point at middle of submedian fold and bar at inner margin; a postmedial crimson point at discal fold and bar from submedian fold to inner margin; a curved diffused crimson subterminal line and a terminal band except on the black costal area; cilia deep crimson. Hind wing glossy ochreous brown; a crimson subbasal patch from cell to inner margin; a discoidal patch with oblique line from it to inner margin; a strong postmedial line somewhat excurved at middle; a subterminal band expanding into a patch at costa; and a narrow band before the ochreous terminal line; cilia deep crimson. Underside ochreous suffused with fuscous brown; fore wing with some pale points on medial part of costa and both wings with pale curved postmedial line.

Hab. GOLD COAST, Bibianaha (*Spurrall*) 1 ♀ type. *Exp.* 18 mm.

(19a) *Pyralis exumbralis*, sp. n.

♂. Head, thorax, and abdomen brownish ochreous. Fore wing ochreous; a rather diffused fuscous patch below the cell; a small black discoidal spot; a fuscous subterminal shade, not reaching the costa and narrowing to tornus. Hind wing ochreous; a subbasal patch of black irroration, the rest of wing irrorated with fuscous; a curved whitish postmedial line. Underside ochreous irrorated with fuscous; fore wing with blackish discoidal point and both wings with whitish postmedial line.

Hab. GOLD COAST, Bibianaha (*Spurrall*) 1 ♂ type. *Exp.* 16 mm.

(1b) *Pyralis flavirubralis*, sp. n.

♂. Head, thorax, and abdomen purplish red mixed with some yellowish. Fore wing purplish red slightly irrorated with brownish, the medial area yellow irrorated with red and more suffused with red towards inner margin; antemedial line whitish, slightly sinuous below the cell; a blackish discoidal point; postmedial line whitish, incurved below discal fold; cilia yellowish tinged with red. Hind wing purplish red thickly irrorated with fuscous; an indistinct oblique slightly sinuous whitish antemedial line and curved slightly waved postmedial line; cilia purplish red with a fine white line at base. Underside ochreous white irrorated with red; both wings with small blackish discoidal spot.

Hab. TRANSVAAL, White R. (*Cooke*), 1 ♂ type. *Exp.* 18 mm.

(1d) *Pyralis perpulverea*, sp. n.

♀. Head and thorax whitish tinged with rufous and irrorated with dark brown; abdomen whitish tinged with rufous; palpi, pectus, legs, and ventral surface of abdomen rufous, the tarsi dark brown ringed with white. Fore wing rufous mixed with some whitish, especially towards inner margin and thickly irrorated with

fuscous; a slight blackish discoidal striga; cilia black mixed with some grey, a pale reddish line at base and some reddish scales at tips. Hind wing whitish tinged with rufous; cilia rufous with a fine whitish line at base and dark line near tip except towards terminus. Underside of fore wing pale fuscous brown, the costal and terminal areas rufous; hind wing whitish tinged with red-brown, the apical area rufous.

Hab. BR. C. AFRICA, Mt. Manje (*Neave*), 1 ♀ type; PORT. E. AFRICA, Mt. Chipero (*Neave*), 1 ♀. *Exp.* 22 mm.

(1c) *Tegulifera irroralis*, sp. n.

♀. Head, thorax, and abdomen brownish grey irrorated with black; the anal tuft rufous; antennae whitish ringed with black. Fore wing brownish grey tinged with rufous especially towards costa and irrorated with black; a series of whitish points on costa with some blackish between them except towards base; a terminal series of black bars; cilia fuscous with a fine whitish line at base and blackish line near tips. Hind wing brownish grey tinged with rufous and irrorated with black; an indistinct pale curved post-medial line defined on inner side by blackish; a terminal series of black striae; cilia fuscous mixed with grey, a fine whitish line near base and blackish line near tips. Underside of fore wing rufous irrorated with blackish, the inner area whitish; a series of white points on costa with black between them, a blackish discoidal striga, a pale subterminal line defined on inner side by blackish, angled outwards to termen at vein 3; hind wing pale rufous irrorated with blackish, a black discoidal point and postmedial line defined on outer side by whitish and excurved at middle.

Hab. W. AFRICA (*Dudgeon*), 1 ♀ type; S. NIGERIA, Lagos (*Sir G. Carter*), 1 ♀. *Exp.* 16 mm.

(2b) *Tegulifera purpurascens*, sp. n.

♂. Head and thorax purplish red with a few fuscous scales; abdomen ochreous suffused with purplish red and irrorated with black, the extremity clear ochreous; palpi black at tips; pectus, legs, and ventral surface of abdomen purplish red irrorated with black. Fore wing purplish red irrorated with black; a rather irregularly waved almost medial black line defined on inner side by diffused ochreous; the medial part of costa with some whitish points with black between them; postmedial line black defined on outer side by diffused ochreous, waved, excurved between veins 5 and 2 and incurved at submedian fold; a terminal series of black points. Hind wing ochreous suffused with purplish red and irrorated with fuscous; traces of a curved blackish antemedial line and a distinct curved postmedial line; a terminal series of black points. Underside ochreous tinged with purplish red; both wings with small black discoidal spot and curved postmedial line.

Hab. S. NIGERIA (*Sampson*), 1 ♂ type. *Exp.* 22 mm.

(2 d) *Tegulifera elæomesa*, sp. n.

♂. Head and thorax pale olive-brown, the vertex of head and tips of patagia tinged with purplish red; abdomen pale olive-brown suffused with purplish red towards base and irrorated with some black scales towards extremity; pectus, legs, and ventral surface of abdomen whitish suffused with purplish red and irrorated with black. Fore wing pale olive-brown, the terminal area purplish red irrorated with black; a curved whitish antemedial line with a purplish-red patch irrorated with black before it from cell to inner margin; the medial part of costa with some white points with black between them; a black discoidal point; a slightly incurved white postmedial line with some black irroration before it below the cell; a fine white line at base of cilia. Hind wing purplish red irrorated with black; two curved whitish medial lines, the area between them suffused with blackish; a fine white line at base of cilia. Underside purplish red irrorated with black and mixed with whitish towards base; both wings with obscure black discoidal spots; fore wing with the postmedial line indistinct; hind wing with slightly waved, white, medial line defined on inner side by rather diffused black.

Hab. GOLD COAST, Aburi (*Johanson*). 1 ♂, Bibianaha (*Spurrell*). 2 ♂ type. *Exp.* 14 mm.

(2 g) *Tegulifera oboculis*, sp. n.

Head and thorax pale red with a few fuscous scales; abdomen pale reddish, the base purplish red; subdorsal black fasciæ except at base, connected dorsally on 2nd segment and on two terminal segments; pectus, legs, and ventral surface of abdomen pale reddish. Fore wing pale rufous slightly irrorated with fuscous, the ovate terminal area chocolate-brown; antemedial line whitish defined on outer side by blackish, rather oblique; a small black discoidal spot; the medial part of costa with whitish points with some black between them; postmedial line whitish defined on inner side by blackish, incurved; a fine white line at base of cilia. Hind wing red-brown with a slight purplish-red tinge; a curved whitish antemedial line defined on outer side by dark brown; a small blackish spot at upper angle of cell; postmedial line whitish defined on inner side by dark brown, rather obliquely curved; a fine white line at base of cilia. Underside whitish tinged with rufous especially in and beyond the cell of fore wing and on terminal areas of both wings, the costal areas with some black irroration; fore wing with the whitish and black points on costa extending to base, the postmedial line very slightly waved; hind wing with dark antemedial line from cell to inner margin, small discoidal spot and oblique slightly waved postmedial line.

Hab. GOLD COAST, Kumasi (*Whiteside*), 1 ♂, 1 ♀ type; NATAL, Durban (*Leigh*), 1 ♀. *Exp.* 24-28 mm.

(2h) *Tegulifera semicircularis*, sp. n.

♀. Head, thorax, and abdomen whitish suffused with pale red-brown. Fore wing whitish suffused with pale olive-brown and slightly irrorated with black, the semicircular terminal area deep chocolate-red and defined on inner side by an incurved white shade; antemedial line white defined on inner side by brown, rather oblique; a black discoidal spot; cilia white, tinged with reddish brown except at base. Hind wing whitish suffused with pale red-brown; two oblique dark medial lines defined by white, the inner line on inner side, the outer on outer side, the area between them rather whiter; a fine red-brown terminal line; cilia pale reddish, white at base and with some dark scales at tips. Underside whitish suffused with rufous; fore wing with black points on costa to beyond middle, a black discoidal point, the terminal area purplish red defined on inner side by an incurved white line; hind wing with oblique very slightly waved reddish-brown postmedial line.

Hab. GOLD COAST, Bibianaha (*Spruell*), 1 ♀ type. *Exp.* 28 mm.

(2i) *Tegulifera tripartita*, sp. n.

♂. Head whitish tinged with red-brown; thorax red-brown tinged with grey; abdomen whitish tinged with red-brown; legs dark brown, the tarsi ringed with white. Fore wing with the basal and terminal areas dark red-brown with a greyish gloss, the medial area pale grey slightly tinged with red-brown and irrorated with dark brown; antemedial line white slightly defined on outer side by brown, excurved to submedian fold, then incurved; the medial part of costa with a series of white points with dark brown between them; a small dark brown discoidal spot; postmedial line white slightly defined on inner side by brown, slightly incurved below vein 3; cilia pale red-brown with a fine white line at base defined on outer side by a dark line. Hind wing greyish with dark red-brown irroration along vein 1 and on terminal half; an oblique brown line from upper angle of cell to inner margin at the postmedial line which is pale defined on each side by brown, curved; cilia pale red-brown with a fine white line at base defined on outer side by a dark line. Underside of fore wing reddish ochreous irrorated with brown, the terminal area suffused with red-brown, the inner area white, the basal area darker to submedian fold, the costa black-brown with series of prominent white points to the postmedial line, which is dark defined on outer side by white forming a small spot at costa, a blackish discoidal spot; hind wing whitish tinged with rufous and irrorated with red-brown except on inner area, a dark discoidal spot and curved postmedial line defined on outer side by whitish.

Hab. ASSAM, Khâsis (*Nissary*), 3 ♂ type. *Exp.* 26 mm.

(3b) *Tegulifera ochrimesalis*, sp. n.

♀. Head, thorax, and abdomen yellow, the tegulae tinged with

purplish pink, the abdomen suffused with purplish pink and irrorated with black except at extremity; pectus, legs, and ventral surface of abdomen ochreous yellow. Fore wing ochreous yellow tinged with purplish pink and slightly irrorated with dark scales, the medial area and termen almost clear ochreous; antemedial line yellow slightly defined on outer side by brownish, curved; a blackish point at upper angle of cell; postmedial line yellow slightly defined on inner side by brownish, slightly excurved at middle and incurved at submedian fold. Hind wing yellowish suffused with purplish pink and irrorated with blackish; wavy whitish medial and postmedial lines; a terminal series of small blackish spots except towards tornus. Underside ochreous tinged with brown; both wings with indistinct pale sinuous ante- and postmedial lines defined by brownish; fore wing with slight dark discoidal spot.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♀ type. *Exp.* 20 mm.

(3d) *Tegulifera pallidalis*, sp. n.

♂. Head and thorax ochreous tinged with reddish; abdomen ochreous faintly tinged with purplish red and slightly irrorated with brown; fore and mid legs suffused with red-brown. Fore wing pale ochreous slightly irrorated with brown, the terminal area tinged with purplish pink; a series of slight dark points on costa; a slight dark discoidal spot; a straight pale ochreous postmedial line defined on inner side by brown and on outer by the pink terminal area; a terminal series of dark points; cilia brownish ochreous. Hind wing ochreous white; a rather punctiform brownish terminal line except towards tornus; cilia ochreous, tinged with brown towards apex. Underside ochreous white; fore wing with the costal and terminal areas tinged with pinkish, some pale points on costa towards base, a small brown discoidal spot, the postmedial line indistinct, whitish; hind wing with the costa deeper ochreous, an oblique brown postmedial line from costa to discal fold.

Hab. UGANDA, Gondotroto (*Reynes-Cole*), 1 ♂ type. *Exp.* 20 mm.

(4a) *Tegulifera bostralis*, sp. n.

♀. Head and thorax ochreous suffused with red-brown; abdomen ochreous irrorated with black-brown; legs suffused with red-brown; ventral surface of abdomen tinged with reddish. Fore wing with the basal and terminal areas red-brown, the medial area ochreous slightly irrorated with brown, more thickly towards costa; a pale antemedial line defining the basal area; some pale points on medial part of costa; a small black discoidal spot; postmedial line pale, oblique, slightly excurved at middle, then incurved; a terminal series of small blackish spots and a pale line at base of cilia. Hind wing ochreous tinged with red-brown, the terminal half suffused with pale red-brown; an indistinct sinuous dark medial line defined on outer side by ochreous; a terminal series of blackish bars; cilia red-brown with a pale line at base. Underside

of fore wing ochreous suffused with purplish red except on inner area, a series of whitish points on costa with dark brown between them to the oblique pale postmedial line; hind wing ochreous, the costal area and terminal half tinged with purplish red, a small blackish spot at upper angle of cell and oblique sinuous brown medial line.

Hab. BR. E. AFRICA, Kakumega Forest, Yala R. (*Neave*), 1 ♀ type. TRANSVAAL, White R. (*Cooke*), 1 ♀. *Exp.* 26-28 mm.

(6c) *Tegulifera metasarcistis*, sp. n.

♂. Head and thorax ochreous mixed with dark brown; abdomen ochreous; antennae brownish; palpi dark brown irrorated with whitish; legs suffused with dark brown, the tarsi black-brown ringed with whitish. Fore wing ochreous thickly irrorated with purplish red and some black except on basal inner area; a pale postmedial line, excurved below discal fold; a terminal series of blackish bars; cilia ochreous tinged with red. Hind wing flesh-pink; a small brown subterminal spot at submedian fold; a blackish terminal line except towards tornus. Underside ochreous tinged with red; hind wing with obliquely curved red postmedial line.

Hab. GOLD COAST, Bibiana (Surrell), 1 ♂ type. *Exp.* 18 mm.

(7a) *Tegulifera flavicornea*, sp. n.

♂. Head, thorax, and abdomen yellow tinged with reddish, the palpi, pectus, legs, and ventral surface of abdomen more strongly tinged with red-brown. Fore wing yellow tinged with purplish pink, especially on terminal half, and slightly irrorated with brown; the costa with series of white points with dark brown between them except towards base; a pale subterminal line, excurved from below costa to vein 2; a fine white line at base of cilia defined on its outer side by a black line. Hind wing golden yellow with a black line at base of cilia. Underside yellow, the costal and terminal areas tinged with purplish red and the former irrorated with dark brown; fore wing with series of white points on costa with black between them, a curved white subterminal line defined on inner side by blackish, a terminal series of small blackish spots; hind wing with curved white subterminal line defined on inner side by blackish.

Hab. BORNEO, Sandakan (*Pryer*), 1 ♂ type. *Exp.* 22 mm.

(7b) *Tegulifera flareola*, sp. n.

♀. Head, thorax, and abdomen yellowish suffused with purplish red; palpi dull purplish red. Fore wing yellowish suffused with dull purplish red and irrorated with blackish scales, the area from middle of wing to the postmedial line more strongly suffused; a faint dark discoidal spot; the postmedial line indistinct, excurved at middle and incurved below vein 2; a terminal series of small blackish spots. Hind wing yellowish, suffused and irrorated with

dark brown to the indistinct curved postmedial line, the terminal area very slightly irrorated; a terminal series of small dark brown spots; cilia with a dark brown line through them. Underside yellow; fore wing tinged and irrorated with brown to the postmedial line, the terminal area slightly irrorated, more strongly towards costa; hind wing irrorated with brown to the indistinct irregular postmedial line, the terminal area sparsely irrorated from costa to vein 2.

Ab. 1. Wings uniformly suffused with red and irrorated with blackish; fore wing with the postmedial line hardly traceable; hind wing with it indistinct; the underside uniformly suffused with red and irrorated with black, both wings with curved slightly waved blackish postmedial line.

Hab. CAMEROONS, Ja R., Bitje (Bates), 3 ♀ type. *Exp.* 20-24 mm.

(7 c) *Tegulifera chromalis*, sp. n.

♂. Head, thorax, and abdomen golden yellow suffused with purplish red; palpi yellow tinged with purplish red in front towards base; fore coxae and mid femora towards base deep purple, the fore and mid tibiae black-brown, the tarsi black-brown ringed with whitish. Fore wing golden yellow, the basal area to just below the cell purplish red, the apical area from middle of costa to termen at vein 1 suffused and irrorated with purplish red leaving a conical almost clear yellow patch from postmedial part of costa to below vein 5, the inner area irrorated with a few red scales; some yellow points on medial part of costa; the antemedial line represented by a yellow bar from costa to median nervure; the postmedial line faint and excurved from vein 6 to 2, then incurved; cilia glossy black-brown. Hind wing golden yellow irrorated with purplish red to the postmedial line and on terminal area from apex to vein 4; an oblique curved red antemedial line joined at inner margin by the curved slightly waved postmedial line; cilia glossy black-brown except towards tornus. Underside yellow; fore wing more evenly irrorated with red, the costa deep purplish red with pale points on it to the indistinct curved yellow postmedial line; hind wing with the costal area irrorated with red, a faint curved postmedial line formed by red scales.

Hab. CAMEROONS, Ja R., Bitje (Bates), 1 ♂ type. *Exp.* 30 mm.

(7 d) *Tegulifera ochrealis*, sp. n.

♀. Orange-yellow. Fore wing with faint traces of curved postmedial line. Hind wing rather paler.

Hab. MASHONALAND (Dobbie), 1 ♀ type. *Exp.* 20 mm.

(9 a) *Tegulifera conisalis*, sp. n.

♂. Head, thorax, and abdomen greyish suffused with mid reddish brown; fore tarsi dark brown ringed with whitish; dull

and hind tarsi whitish. Fore wing greyish tinged with red-brown and thickly irrorated with dark red-brown; an oblique whitish antemedial line defined on outer side by diffused dark brown; some whitish points on medial part of costa with dark brown between them; a small dark brown discoidal spot; postmedial line whitish defined on inner side by dark brown, slightly waved and curved to vein 2 and incurved at submedian fold; a terminal series of small dark brown spots and whitish line at base of cilia. Hind wing whitish tinged and irrorated with brown; a terminal series of small dark brown spots. Underside whitish tinged and irrorated with purplish brown, the inner areas paler; both wings with small dark discoidal spot and curved postmedial line; fore wing with the costa dark brown with white points on it to the postmedial line.

Hab. GERM. E. AFRICA, Dar-es-Salaam, 1 ♂ type. *Exp.* 16 mm.

(2) *Elaealis metachalcistis*, sp. n.

♂. Head, thorax, and abdomen dark red-brown; antennae whitish ringed with brown; fore tarsi ringed with whitish, the mid and hind tarsi whitish tinged with red-brown. Fore wing dark red-brown with a cupreous gloss; a series of whitish points on costa to beyond middle and a postmedial whitish spot tinged with reddish. Hind wing golden cupreous irrorated with dark red-brown, the costal and terminal areas dark red-brown, the latter narrowing to tornus; the underside reddish ochreous, the basal part of costal area and cell mottled with reddish ochreous defining a dark brown discoidal spot, the terminal area dark brown narrowing to tornus.

♀. Fore wing with narrow whitish postmedial band tinged with reddish.

Hab. BR. E. AFRICA, Kikuyu Escarpment, Ibea (*Doherty*), 2 ♂, 1 ♀ type. *Exp.* 18-20 mm.

(1a) *Stemmatophora albiceps*, sp. n.

Antennae of male with the basal joint very long.

Head ochreous white, the antennae dark brown except the basal joint, the palpi with dark brown spot at side of 2nd joint, the 3rd dark brown with white tips; tegulae ochreous white irrorated with some dark brown scales and dark brown at sides; thorax whitish, the patagia dark brown at sides; abdomen reddish brown tinged with grey, the anal tuft ochreous; pectus, legs, and ventral surface of abdomen dark brown tinged with grey. Fore wing dark reddish brown; triangular white ante- and postmedial patches on costa with faint slightly curved whitish lines from them to inner margin and two white points between them on costa; cilia with a fine white line at base and some whitish at tips. Hind wing dark reddish brown with curved whitish ante- and postmedial lines; cilia with a slight whitish line at base. Underside fuscous brown; fore wing with the inner area whitish, a series of ochreous-white points on costa to an ochreous-white postmedial patch with slight

line from it to inner margin; hind wing with oblique whitish postmedial line defined on inner side by darker brown.

Hab. N. NIGERIA, Minna (*Macfie*), 1 ♂ type, Zungeru (*Macfie*), 1 ♂, 1 ♀. *Exp.*, ♂ 14, ♀ 16 mm.

(2a) *Stenmatophora oleoalbalis*, sp. n.

♂. Head and thorax white with a faint brownish tinge; abdomen whitish tinged with red-brown and irrorated with dark brown scales; antennæ ringed with brown; pectus and legs suffused with red-brown, the tarsi dark brown ringed with white; ventral surface of abdomen dark brown towards extremity. Fore wing white tinged with pale olive and irrorated with a few black scales; a slight black mark at base of costa; the medial area black with white points on costa and defined by the diffused white ante- and postmedial lines, the former nearly straight, the latter strongly excurved at middle, then incurved, a wedge-shaped rufous patch beyond it on costa; a terminal series of faint black points. Hind wing white with a faint brownish tinge; a faint curved dark postmedial line; a terminal series of black points except towards tornus. Underside whitish tinged with rufous; fore wing with whitish points with black between them to the postmedial line, the medial area suffused with blackish; hind wing with slight dark point at upper angle of cell and rather diffused black postmedial line defined on outer side by white and excurved at middle.

Hab. BR. E. AFRICA, Nairobi (*Anderson*), 1 ♂ type. *Exp.* 20 mm.

(2b) *Stenmatophora chloralis*, sp. n.

Stenmatophora chloralis, Longstaff, *Butterfly Hunting in Many Lands*, pl. ii. fig. 9.

♀. Head white; antennæ with the extreme base of shaft black; thorax white tinged with very pale blue-green; pectus, legs, and abdomen white irrorated with a few black scales, the tarsi slightly ringed with black. Fore wing white very finely pencilled with pale blue-green; a black striga from base of costa; a black point on middle of costa; an oblique black band, defined on each side by rather diffused white from costa just beyond middle to inner margin, with some white points on it at costa, expanding into a large elliptical black patch in and beyond the cell, then narrowing and again slightly expanding to inner margin; a terminal series of slight black points with a more prominent point above tornus. Hind wing white, the terminal area slightly irrorated with black scales, extending on costa to middle and narrowing to tornus; a slight fuscous mark at lower angle of cell; a terminal series of small black spots from apex to submedian fold. Underside of fore wing with prominent series of black striae on costa from base to the postmedial band which is obsolescent.

Hab. ZAMBESI, Victoria Falls (*Longstaff*), 1 ♀ type, ♂ in Coll. Longstaff. *Exp.* 24 mm.

(6c) Stenmatophora cupricolor, sp. n.

♂. Head, thorax, and abdomen pale red with a whitish tinge, the pectus, legs, and ventral surface of abdomen whiter. Fore wing cupreous red slightly irrorated with black; a whitish postmedial line, oblique to vein 6, then sinuous; a fuscous terminal line; cilia fuscous mixed with whitish and with black line near base. Hind wing fiery red irrorated with blackish; a blackish antemedial line, oblique to submedian fold, where there is a white patch before it, then sinuous and defined on inner side by whitish; a curved white postmedial line slightly defined on inner side by blackish; cilia fuscous mixed with whitish and with black line near base. Underside of fore wing grey-brown, a slight dark postmedial line defined on outer side by whitish, oblique to vein 5, then slightly incurved; hind wing brownish white slightly irrorated with brown, a slight curved brown postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♂ type. *Exp.* 26 mm.

(6d) Stenmatophora olivotincta, sp. n.

♂. Head, thorax, and abdomen whitish tinged with olive-brown; pectus, legs, and ventral surface of abdomen tinged with crimson. Fore wing, whitish suffused with pale olive-brown; a slightly curved white antemedial line; the medial part of costa with series of white points with dark brown between them; a straight erect white postmedial line; a slight crimson terminal line; cilia bright crimson with a fine white line at base. Hind wing whitish suffused with pale olive-brown; traces of a curved white antemedial line and a more distinct postmedial line; a slight crimson terminal line; cilia bright crimson with a fine white line at base. Underside white tinged with rufous; fore wing with large patch of crimson suffusion in and beyond the cell and below lower end of cell with slight crimson suffusion beyond it between veins 5 and 2; hind wing with crimson antemedial line oblique to median nervure, the medial part of costa and a spot at upper angle of cell crimson, a strong rather diffused crimson postmedial line, the terminal area tinged with crimson towards apex and in submedian interspace.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♀ type. *Exp.* 24 mm.

(6f) Stenmatophora hemicyclalis, sp. n.

Head and thorax ochreous tinged with rufous and irrorated with a few dark brown scales; abdomen ochreous white irrorated with dark brown scales forming diffused dorsal bands except towards base; palpi and fore legs dark reddish brown, the latter with the tarsi ringed with white. Fore wing ochreous whitish irrorated with dark brown, the basal area suffused with red-brown, the costa dark brown with slight whitish points to beyond middle; a minute black discoidal spot; postmedial line white, incurved from costa towards apex to tornus, the semicircular terminal area suffused with

dark brown shading to red-brown at termen; a terminal series of black points; cilia greyish suffused with brown. Hind wing white irrorated with brown except on terminal area from apex to vein 3 which is faintly tinged with rufous; an indistinct obliquely curved dark postmedial line; a terminal series of small black spots; cilia tinged with brown and with a brownish line near base. Underside whitish; fore wing irrorated with brown especially on basal half, an indistinct erect dark postmedial line; hind wing with the costal area irrorated with brown, an indistinct obliquely curved dark postmedial line.

Hab. TRANSTAAL, White R. (*Cooke*), 1 ♂, 1 ♀ type. *Exp.*, ♂ 20, ♀ 22 mm.

(11 a) *Stemmatophora perrubralis*, sp. n.

♀. Head and thorax fiery rufous; abdomen yellowish tinged with rufous, the ventral surface deeper rufous. Fore wing fiery rufous slightly irrorated with dark brown; antemedial line pale slightly defined on outer side by black scales, rather oblique; a small black discoidal spot; postmedial line whitish slightly defined on inner side by dark scales, almost straight and erect; a slight dark terminal line and whitish line at base of cilia which are brown and whitish at tips. Hind wing yellowish suffused with fiery red; a curved whitish postmedial line slightly defined on inner side by red; a fine whitish line at base of cilia. Underside yellowish suffused with fiery red; both wings with faint red postmedial line defined on outer side by whitish.

Hab. LOURENÇO MARQUES, Shilouvane (*Janod*), 2 ♀ type. *Exp.* 28 mm.

(12 a) *Stemmatophora minimalis*, sp. n.

Head, thorax, and abdomen whitish suffused with pale red-brown; pectus, legs, and ventral surface of abdomen whitish irrorated with dark brown. Fore wing whitish suffused with pale red-brown and irrorated with blackish; the costa with slight whitish points with blackish between them to the postmedial line; a curved whitish antemedial line; a faint dark medial line, slightly excurved to submedian fold, then incurved; postmedial line whitish slightly defined on inner side by dark brown and slightly curved; cilia brown with pure white tips. Hind wing whitish suffused with pale red-brown and irrorated with blackish; an oblique whitish antemedial line curved inwards to costa; a straight white postmedial line; cilia brown, pure white at tips. Underside whitish suffused with reddish and irrorated with brown; both wings with curved white postmedial line.

Hab. CEYLON, Trincomali (*Green*), 1 ♂, 1 ♀ type. *Exp.*, ♂ 12, ♀ 14 mm.

(12f) *Stemmatophora excurvalis*, sp. n.

♀. Head, thorax, and abdomen whitish suffused with pale red-brown and irrorated with dark brown, the last with blackish dorsal bands on two medial segments. Fore wing whitish suffused with pale red-brown and irrorated with dark brown; a narrow inwardly oblique whitish antemedial band; the medial part of costa with slight whitish points with dark brown between them; a faint blackish discoidal spot; postmedial line whitish slightly defined on inner side by fuscous, slightly incurved to discal fold, then strongly excurved to vein 2, then incurved; cilia with a white line at base, the tips fuscous and white. Hind wing whitish tinged with pale red-brown and irrorated with brown, the apical area more suffused with brown; a diffused curved whitish postmedial line; a terminal series of slight dark spots; cilia white with dark lines near base and tips. Underside white tinged with red-brown and irrorated with dark brown; fore wing thickly irrorated except on inner area, the costa with whitish points with dark brown between them to the postmedial line; a small blackish discoidal spot; hind wing with small black discoidal spot and rather diffused blackish postmedial line defined on outer side by whitish and excurved at middle.

Hab. BR. E. AFRICA, Nairobi (Anderson), 1 ♀ type. Exp. 20 mm.

(12g) *Stemmatophora postaurantia*, sp. n.

Head, thorax, and abdomen whitish tinged with rufous, the last irrorated with black on terminal half; antennae slightly ringed with black. Fore wing whitish tinged with pale rufous and irrorated with black; a patch of black irroration at base of costal area; antemedial line black, diffused, slightly excurved at submedian fold; the medial part of costa black with white points on it; a black discoidal spot; postmedial line black, diffused, slightly incurved at discal fold and angled inwards at submedian fold; a patch of black irroration on costal area towards apex; a terminal series of small black spots. Hind wing reddish orange with a terminal series of small black spots. Underside of fore wing orange-red, the costal and inner areas whitish tinged with olive-brown, the costa with series of whitish points with some black between them to the diffused black postmedial line, slightly incurved at discal and submedian folds, a black discoidal spot; hind wing orange-red, the costal and terminal areas irrorated with a few blackish scales, an indistinct oblique postmedial line formed by blackish scales.

Hab. BR. C. AFRICA, Mt. Mlanje (Neave), 1 ♂, 1 ♀ type. Exp. 20 mm.

(13a) *Stemmatophora erebalis*, sp. n.

Head, thorax, and abdomen red-brown largely mixed with black; tarsi pale. Fore wing reddish brown very thickly irrorated with

black; a pale waved antemedial line; the medial area with series of black and pale points on costa; a black discoidal spot; a pale minutely waved postmedial line defined by black on inner side and excurved at middle; a terminal series of small black spots; cilia reddish with dark lines at middle and tips. Hind wing fuscous with indistinct blackish discoidal spot; a pale curved postmedial line; a fine black terminal line; cilia pale with diffused dark line through them.

Hab. GOLD COAST, Ajinak (*Dudgeon*), 2 ♂, 1 ♀ type; N. NIGERIA, Minna (*Macfie*), 3 ♂, 1 ♀, Zungeru (*Macfie*), 2 ♂, 2 ♀, Bida (*Macfie*), 3 ♀; MASHONALAND (*Dobbie*), 1 ♀. *Exp.*, ♂ 20, ♀ 26 mm.

(15b) *Stemmatophora fusilinealis*, sp. n.

Head, thorax, and abdomen ochreous suffused with rufous, the terminal half of abdomen with black strongly mixed; fore legs black-brown, the tarsi ringed with white; mid legs suffused with black-brown, the tarsi whitish ringed with black. Fore wing ochreous suffused with cupreous red and slightly irrorated with black; a diffused curved black antemedial line; the medial part of costa with series of white points with black between them; a small black discoidal spot; a diffused black postmedial line, angled inwards at discal and submedian folds and with its outer edge minutely dentate; traces of a waved subterminal line formed by black scales; a terminal series of black stræ; cilia with blackish lines near base and tips. Hind wing ochreous suffused with cupreous red; an indistinct curved slightly waved dark postmedial line; a terminal series of black stræ; cilia with blackish lines near base and tips. Underside ochreous suffused with cupreous red; fore wing with series of whitish points with blackish between them to the postmedial line, the other markings as above.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 3 ♂, 1 ♀ type. *Exp.* 22 mm.

(5a) *Herédia roseotincta*, sp. n.

Head, thorax, and abdomen white tinged with pinkish brown; palpi and legs suffused with red-brown. Fore wing whitish suffused with brownish pink and faintly irrorated with brownish, the costal edge whiter; antemedial line white, angled outwards below costa, then oblique; a slight brownish discoidal spot; postmedial line white, oblique; a whitish line at base of cilia. Hind wing white, the terminal half tinged with pink except towards torus; a faint white postmedial line slightly defined on inner side by pink; a terminal series of pink points to submedian fold; the cilia tinged with pink and with whitish line at base to submedian fold. Underside of fore wing rose-red, the inner area white, the costa with series of white points with brown between them to the obliquely curved white postmedial line; hind wing white, the costal area suffused and irrorated with pink, a slight pinkish discoidal point, a

curved white postmedial line slightly defined on inner side by pink from costa to submedian fold.

Hab. TRANSVAAL, White R. (*Cooke*), 1 ♀, Pretoria (*Distant, Janse*), 2 ♂, 4 ♀ type. *Exp.* 22-24 mm.

*(15 a) *Herculia plumbeoprunalis*, sp. n.

Head and thorax yellowish suffused with purplish red; thorax and abdomen greyish suffused with purplish red; pectus, legs, and ventral surface of abdomen purplish red. Fore wing reddish brown with a leaden-grey gloss, the costal area yellow suffused with purplish red; a slightly curved brown antemedial line defined on inner side by yellowish; a series of yellow points on medial part of costa with dark red-brown between them; a slight brown discoidal striga; the postmedial line almost subterminal, with a yellow bar from costa to vein 6, then a slight pale line excurved to vein 2; cilia yellow, deep red at base and apex. Hind wing reddish brown glossed with leaden grey; a faint pale curved postmedial line; cilia yellow, deep red at base. Underside whitish tinged with brown; fore wing with the costal area yellow tinged with red and with yellow points on costa with brown between them to the postmedial line; hind wing with curved brown postmedial line.

Hab. W. COLOMBIA, R. Jimenez, 1 ♀, R. Dagua, 1 ♀; VENEZUELA, Esteban Valley, Las Quiguas, 2 ♀; ECUADOR, R. Pastaza, Alpayacu (*Palmer*), 1 ♂. *Exp.* 22-30 mm.

(22 b) *Herculia perpulverea*, sp. n.

♀. Head, thorax, and abdomen brownish ochreous irrorated with dark brown; pectus, legs, and ventral surface of abdomen pale red-brown. Fore wing brownish ochreous thickly irrorated with dark brown; traces of a curved brownish antemedial line defined on inner side by diffused ochreous; postmedial line indistinct, brown defined on outer side by ochreous, strongly excurved; a fine pale line at base of cilia. Hind wing brownish ochreous thickly irrorated with dark brown; a faint curved dark postmedial line; a fine pale line at base of cilia. Underside ochreous whitish tinged and irrorated with red-brown; both wings with faint curved brown postmedial line.

Hab. GOLD COAST, Kumasi (*Sanders*), 1 ♀ type. *Exp.* 24 mm.

(24 b) *Herculia griseobrunnea*, sp. n.

♂. Head, thorax, and abdomen purplish brown mixed with grey; antennae whitish tinged with brown; mid tarsi and hind legs whitish. Fore wing purplish brown irrorated with grey; antemedial line white, excurved to submedian fold; the medial part of costa with white points with dark brown between them; postmedial line white, expanding at costa, then slightly waved and

excurved at middle; a fine white line at base of cilia followed by a brown line. Hind wing whitish suffused and irrorated with purple-brown; a curved white postmedial line; a fine white line at base of cilia followed by a brown line. Underside white thickly irrorated with brown; fore wing with white points with dark brown between them on costa to the postmedial line.

Hab. TRANSVAAL, Groenvlei (Janse), 1 ♂, Merwe (Janse), 1 ♂ type, Pretoria (Janse), 1 ♂. *Exp.* 18 mm.

(25 a) *Herculia purpureorufa*, sp. n.

♀. Head, thorax, and abdomen greyish suffused with purple-red; hind legs whitish. Fore wing deep purplish red; a curved white antemedial line expanding into a patch on costa; two white points on medial part of costa; a white postmedial bar from costa to vein 6, then a fine line excurved at middle and above inner margin and incurved at submedian fold; a white line at base of cilia. Hind wing deep purple-red irrorated with a few dark brown scales; an obliquely curved white antemedial line joined above inner margin by a similar postmedial line and both slightly excurved just below submedian fold; a fine white line at base of cilia followed by a dark brown line. Underside purple-red thickly irrorated with dark brown; fore wing with white points on costa to the postmedial line; hind wing with curved white postmedial line.

Hab. MADRAS, Belgaum (Watson), 1 ♀ type. *Exp.* 20 mm.

(26 b) *Herculia pyrrerythra*, sp. n.

♂. Head, thorax, and abdomen purplish red, the anal tuft yellowish; legs irrorated with black. Fore wing deep purple-red irrorated with black, the medial area more thickly irrorated except towards costa; a curved whitish antemedial line; the medial part of costal area paler with slight white points with black between them on the costa; postmedial line whitish, expanding at costa, excurved at middle and above inner margin; cilia fuscous brown with fine white line at base and diffused whitish line at middle. Hind wing deep purple-red irrorated with black, the medial area more thickly irrorated; an oblique white antemedial line and white postmedial line excurved at middle and above inner margin; cilia fuscous brown with a fine white line at base and more diffused line at middle. Underside purple-red thickly irrorated with black; fore wing with white points on costa to the postmedial line; hind wing with the postmedial line defined on inner side by black.

Hab. N. NIGERIA, Zungeru (Simpson), 1 ♂ type. *Exp.* 16 mm.

(26 c) *Herculia lacteocilia*, sp. n.

Head, thorax, and abdomen greyish suffused with pale purplish red, the last irrorated with a few dark scales; fore legs dark brown, the tarsi ringed with whitish. Fore wing greyish tinged with

purplish red and irrorated with blackish, the terminal area suffused with fuscous brown; traces of a pale curved antemedial line; the medial part of costa with whitish points with black-brown between them, and with the costal area whiter; postmedial line whitish, oblique; cilia black-brown at base, pale yellow at tips. Hind wing purplish red, irrorated with blackish; oblique slightly sinuous whitish ante- and postmedial lines approximated at inner margin; cilia black-brown at base, pale yellow at tips. Underside whitish suffused with purplish red and irrorated with black; fore wing with white points on costa to the postmedial line; hind wing with oblique white postmedial line.

Ab. 1. Hind wing brighter purplish red; cilia of both wings pure white at tips.

Hab. UGANDA, Toro, Mpanga Forest (Neave), 1 ♂, 1 ♀ type; BR. C. AFRICA, Mt. Mlanje (Neave), 1 ♂. Exp., ♂ 18, ♀ 20 mm.

(32 b) *Herulia perrubralis*, sp. n.

♀. Head, thorax, and abdomen purplish red; mid and hind tarsi whitish. Fore wing deep purple-red; antenaedial line black defined on inner side by whitish, rather oblique; some pale points on medial part of costa with black between them; a small black discoidal spot; postmedial line black defined on outer side by whitish, rather oblique; a terminal series of blackish points and fine whitish line at base of cilia. Hind wing deep purple-red; an oblique blackish antemedial line and singular postmedial line defined on outer side by whitish; a terminal series of slight dark points and fine whitish line at base of cilia. Underside purplish red; both wings with small black discoidal spots and oblique postmedial line; fore wing with whitish points on costa to the postmedial line; hind wing with the costal area irrorated with blackish.

Hab. S. NIGERIA, Idu (Farquhar), 1 ♀ type. Exp. 28 mm.

(34 a) *Herulia castaneorufa*, sp. n.

Head, thorax, and abdomen chestnut-red; antennæ whitish tinged with red. Fore wing chestnut-red; traces of a whitish antemedial line; the medial part of costa with yellow points with dark brown between them; postmedial line yellow, slightly curved, dilated at costa; cilia glossy fuscous brown. Hind wing chestnut-red with a curved yellowish postmedial line; cilia glossy fuscous brown. Underside yellowish tinged with red and irrorated with brown; fore wing with yellowish points with dark brown between them on costa to beyond middle; hind wing with oblique dark brown medial line.

Hab. CAMEROONS, Ja R., Bitje (Bates), 2 ♂, 1 ♀ type. Exp., ♂ 24, ♀ 28 mm.

(34 b) *Herulia flavirufalis*, sp. n.

Head, thorax, and abdomen yellowish tinged with red. Fore

wing yellow tinged with fiery red and slightly irrorated with brown; traces of a yellow antemedial line; the medial part of costa with yellow points with black-brown between them; a yellow postmedial line faintly defined on inner side by brown, slightly excurved at middle; a terminal series of slight brown points; cilia glossy fuscous brown with a fine yellow line at base. Hind wing yellow suffused with fiery red; indistinct curved dark ante- and postmedial lines defined by whitish, the former on inner side, the latter on outer; cilia glossy fuscous brown. Underside yellow tinged with red; fore wing with dark discoidal point and yellowish points on costa with blackish between them to the dark postmedial line defined on outer side by whitish; hind wing with faint curved dark postmedial line.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♂, 1 ♀ type. *Exp.* 22 mm.

(34c) *Herculia ecrhodalis*, sp. n.

♂. Head and thorax pale purplish red; abdomen whitish irrorated with purplish red; antennæ whitish; pectus and legs red-brown; abdomen whitish tinged with red-brown. Fore wing whitish tinged with red and irrorated with purplish red, the terminal area suffused with purplish red; traces of a whitish antemedial line; the medial part of costa with whitish points with dark brown between them; postmedial line whitish, slightly excurved at middle. Hind wing whitish suffused with purple-red; a curved whitish postmedial line; cilia with a whitish line at base. Underside whitish suffused with red-brown; fore wing with whitish points with dark brown between them on costa to the faint pale postmedial line; hind wing with curved whitish postmedial line.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 2 ♂ type. *Exp.* 18 mm.

(34d) *Herculia ecbrunnealis*, sp. n.

♀. Head, thorax, and abdomen greyish tinged with red-brown, the pectus and ventral surface of abdomen redder, the legs brownish with the tarsi ringed with whitish. Fore wing greyish tinged with olive-brown, the terminal area browner; traces of a whitish antemedial line; the medial part of costa with whitish points with dark brown between them; a small dark brown discoidal spot; postmedial line indistinct, dark brown defined on outer side by whitish, excurved at middle, a terminal series of black-brown points and fine whitish line at base of cilia, which are grey-brown. Hind wing greyish tinged with olive-brown, the terminal area browner; a curved brown postmedial line defined on outer side by whitish; a brown terminal line and fine white line at base of cilia, which are grey-brown. Underside ochreous suffused with rufous and irrorated with brown; fore wing with small blackish discoidal spot and whitish points with blackish between them on costa to the postmedial line; hind wing with dark discoidal point and curved postmedial line.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♀ type. *Exp.* 18 mm.

(11) *Triphassa trichotibialis*, n. n.

Triphassa bilinea, Hampson. *Moths Ind.* iv. p. 166 (nec Moore).

Hab. Ceylon.

(1a) *Sacada papuana*, sp. n.

♂. Head, thorax, and abdomen grey mixed with chocolate-brown, the tegulae mostly chocolate-brown; pectus in front and the fringes of hair on fore legs more chocolate-red. Fore wing grey irrorated with chocolate-brown, the basal area from costa to vein 1 chocolate-brown with some fiery rufous in submedian interspace; antemedial line grey, oblique to submedian fold, then inwardly oblique; a reddish-brown discoidal spot defined by grey; postmedial line grey, oblique below vein 4, a broad chocolate-brown shade beyond it; cilia dark brown mixed with grey. Hind wing purplish grey suffused with brown. Underside of fore wing purplish red, the inner area grey, the postmedial line indistinct, whitish; hind wing purplish grey, the costal area suffused with red, an indistinct curved whitish postmedial line ending at tornus.

Hab. BR. N. GUINEA, Dinawa (*Pratt*), 1 ♂, Ekeikei (*Pratt*), 1 ♂ type. *Exp.* 44-48 mm.

(3c) *Sacada erythropis*, sp. n.

♀. Head, thorax, and abdomen purplish pink mixed with red-brown; pectus, legs, and ventral surface of abdomen chestnut-red. Fore wing purplish pink slightly irrorated with brown; a large elliptical crimson-red patch from below costa to above inner margin before the strongly curved fuscous antemedial line; a discoidal bar formed by fiery red and black-brown scales with a pale striga in centre; a diffused obliquely curved rufous line beyond the cell; postmedial line fuscous slightly defined on outer side by whitish, rather oblique to vein 5, then inwardly oblique, a fiery rufous shade beyond it and a chocolate-brown patch between veins 7 and 4; cilia black-brown mixed with red and with a fine whitish line at base. Hind wing dark reddish brown to the indistinct curved postmedial line, then purplish red irrorated with brown; a fine whitish line at base of cilia. Underside of both wings dark brown to the curved black-brown postmedial line defined on outer side by white towards costa of fore wing, the terminal areas purple-red.

Hab. S. NIGERIA, Ilorin (*Macle*), 1 ♀ type. *Exp.* 30 mm.

(5b) *Sacada albiculalis*, sp. n.

♂. Head and thorax greyish mixed with red-brown, the patagia dark red-brown except at base; abdomen greyish suffused with red-brown; antennae red-brown; pectus, legs, and ventral surface

of abdomen bright red-brown. Fore wing red-brown mixed with greyish, the basal part of inner area and the medial area darker greyish brown; a large fiery-red patch below the cell before the antemedial line, which is white and strongly excurved from discal fold to inner margin; a white discoidal bar with its lower extremity slightly angled outwards and a small black-brown spot on its lower part; postmedial line white, rather oblique to vein 5, then inwardly oblique and sinuous to inner margin, where it is approximated to the antemedial line, some fiery red suffusion beyond it. Hind wing whitish suffused with pale reddish; a faint curved dark postmedial line. Underside whitish suffused with pale reddish; fore wing with faint dark postmedial line oblique and sinuous below vein 5; hind wing with faint curved dark postmedial line.

Ab. 1. Fore wing with the ante- and postmedial lines confluent at vein 1 and not reaching inner margin.

Hab. DUTCH N. GUINEA, Fak-fak (*Pratt*), 2 ♂ type. *Exp.* 30 mm.

(9a) *Sacada nyasa*, sp. n.

♀. Head, thorax, and abdomen purple-brown; the hind tarsi with the 1st joint whitish towards base and the other joints ringed with whitish. Fore wing purple; a strongly curved fuscous antemedial line with a broad chocolate-brown shade before it; a deep chocolate-brown discoidal spot with a whitish bar in centre, a chocolate-brown shade beyond the cell, oblique below vein 4; postmedial line fuscous slightly defined on outer side by grey, rather oblique to vein 4, then inwardly oblique, the apical area beyond it chocolate-brown, its lower edge running obliquely to termen at vein 4, and a chocolate-brown shade beyond the postmedial line from vein 4 to inner margin; cilia chocolate-brown. Hind wing pale purple-brown. Underside purple; fore wing with fuscous postmedial line defined on outer side by white towards costa and oblique below vein 4; hind wing with fuscous postmedial line excurved at middle.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♀ type. *Exp.* 42 mm.

(18) *Sacada viridalis*, sp. n.

♀. Head and thorax dull apple-green; abdomen grey suffused with brown; antennæ grey-brown; pectus, legs, and ventral surface of abdomen white tinged with brown. Fore wing dull apple-green, the costal edge red-brown with a series of white points on medial area; antemedial line red-brown, sinuous to median nervure, where it is angled outwards, then oblique; postmedial line red-brown, incurved below costa, excurved to vein 4, then incurved and very slightly waved; cilia pale purplish brown with a fine white line at base. Hind wing dull apple-green, the costal area purple; an oblique purple-brown antemedial line and slightly sinuous postmedial line; cilia pale purplish with a fine white line

at base followed by a dark line. Underside whitish suffused with purple except on inner area; fore wing with the costa red-brown with white points on it to the dark postmedial line, which is ex-curved at middle, a dark discoidal point; hind wing with dark discoidal point and curved postmedial line slightly waved to vein 2.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♀ type. *Exp.* 30 mm.

(2 a) *Paractenia pallidirubra*, sp. n.

♂. Head and thorax whitish suffused with pale purplish red; abdomen white. Fore wing whitish suffused with pale purplish red, the costa rather darker; a small blackish discoidal spot; post-medial line indistinct, dark, rather diffused on inner side and minutely dentate on outer, slightly ex-curved to vein 2 and in-curved at submedian fold; a terminal series of slight blackish spots. Hind wing white faintly tinged with red-brown; a rather punctiform red-brown terminal line. Underside white, the fore wing and costal area of hind wing faintly tinged with red; fore wing with slight dark discoidal spot and obliquely curved post-medial line; hind wing with faint discoidal point and postmedial striga from costa.

Hab. BOMBAY, Deesa (*Nurse*), 1 ♂ type. *Exp.* 24 mm.

(3 a) *Paractenia viridicostalis*, sp. n.

Head yellowish white tinged with red; thorax olive-brown mixed with black-brown and some whitish; abdomen yellowish white tinged with red, irrorated with black and dorsally banded with black; antennæ ringed with black; palpi red-brown, ochreous in front; pectus ochreous in front; legs ochreous tinged with red and irrorated with blackish. Fore wing with the costal and terminal areas olive-green slightly irrorated with blackish; some dark reddish-brown suffusion at base in and below the cell; a broad, obliquely curved, diffused dark reddish-brown fascia from near termen below apex to inner margin near base, a dark brown discoidal spot; a rather lunulate white mark from costa before apex, and broad oblique white postmedial band from vein 5 to inner margin with a dentate brown subterminal line slightly defined on outer side by white on its outer edge with a reddish shade beyond it; a terminal series of small blackish spots; a fine whitish line at base of cilia followed by small dark spots. Hind wing whitish suffused with purplish red and slightly irrorated with brown; some brown suffusion at base; a curved slightly sinuous brown post-medial line defined on outer side by white except towards costa; a terminal series of dark bars separated by white points from apex to submedian fold; cilia with a white line at base followed by a dark line. Underside whitish suffused with red and irrorated with brown; fore wing with broad dark reddish-brown shade on costal area extending to inner margin before middle, a lunulate whitish

patch from costa towards apex and oblique waved brown subterminal line defined on outer side by whitish; hind wing with rather diffused curved slightly waved dark brown postmedial line defined on outer side by whitish.

Hab. DUTCH N. GUINEA, Snow Mts., Setakwa R. (*Meek*), 3 ♂ type. *Exp.* 26-28 mm.

(4a) *Paractenia sanguinincta*, sp. n.

♀. Head, thorax, and abdomen ochreous mixed with some purplish red; pectus, legs, and ventral surface of abdomen tinged with red and irrorated with black. Fore wing yellowish irrorated with purplish red, more thickly on basal costal area; an oblique diffused purplish-red postmedial line, somewhat angled inwards at submedian fold; a maculate deep red terminal line with some blackish scales on it; cilia white at base, blackish fixed with whitish at tips. Hind wing yellowish irrorated with purplish red and blackish; a faint diffused curved reddish postmedial line; a fine blackish terminal line; cilia white at base, blackish mixed with whitish at tips. Underside yellow tinged with purplish red and irrorated with black; both wings with indistinct diffused dark postmedial line.

Hab. GOLD COAST, Kumasi (*Sanders*), 1 ♀ type. *Exp.* 22 mm.

(5a) *Paractenia phanerostola*, sp. n.

♀. Head, thorax, and abdomen pale glossy red-brown, the palpi and fore legs rather deeper red-brown. Fore wing pale glossy red-brown, the costa rather deeper red-brown; a faint rather diffused curved brown antemedial line; a faint brown postmedial line, ex-curved to vein 4, then oblique. Hind wing pale glossy red-brown; a faint diffused oblique brown antemedial line and rather more distinct curved postmedial line. Underside of fore wing whitish suffused with red-brown; hind wing whitish tinged with red-brown; both wings with curved brown postmedial line.

Hab. ECUADOR, R. Bobonaza, Canelos (*Palmer*), 1 ♀ type. *Exp.* 34 mm.

(5b) *Paractenia castaneonigra*, sp. n.

Head, thorax, and abdomen chestnut-red, the last dorsally suffused with black; legs suffused with black, the tarsi black ringed with chestnut. Fore wing chestnut-red, the base and the whole wing beyond the antemedial line suffused with black-brown; antemedial line blackish, oblique to submedian fold, then angled inwards at vein 1; the medial part of costa with reddish-ochreous points; postmedial line indistinct, ochreous, very slightly waved, ex-curved at middle and angled inwards at submedian fold; cilia blackish at base and with some ochreous scales at middle. Hind wing glossy black-brown with a chestnut-red tinge; cilia black at base, bright yellow at tips. Underside black-brown; fore wing

with the costal area chestnut-red to the postmedial line, the costal edge black-brown with ochreous points on it, the postmedial line yellow on costal area, then indistinct; hind wing with the costal area and cell chestnut-red to the postmedial line, the inner area whitish irrorated with black-brown, a yellowish postmedial line slightly incurved in submedian interspace.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♂, 2 ♀ type. *Exp.*, ♂ 28, ♀ 36 mm.

(6 a) *Paraetenia sichimensis*, sp. n.

Head and thorax yellow mixed with brick-red; abdomen yellow tinged with red and irrorated with brown; legs yellow irrorated with dark brown. Fore wing yellow suffused with red and irrorated with brown, the medial area yellower with a nearly clear yellow conical patch from costa before the postmedial line and another patch below end of cell; antemedial line brown defined on outer side by yellow, excurved to median nervure, then oblique; the medial part of costa dark brown with yellow points on it; a small brown discoidal spot; postmedial line brown, diffused on outer side, inwardly oblique and somewhat incurved below vein 5; a terminal series of blackish points; a fine pale line at base of cilia followed by a dark line. Hind wing yellowish white, the termen slightly tinged with red and irrorated with brown; a terminal series of blackish points and fine pale line at base of cilia followed by a dark line. Underside yellow tinged with red and irrorated with dark brown; fore wing with the costal area suffused with brown, a small dark discoidal spot, yellower patch from costa beyond the cell, and diffused oblique dark postmedial line; hind wing with slight brown discoidal spot and curved postmedial line.

Hab. SIKHIM (*Pilcher, Möller*), 8 ♂, 5 ♀ type. *Exp.* 20-24 mm.

(7 a) *Bostra purpurealis*, sp. n.

Head and thorax bright purple-red; abdomen pale purple-red irrorated with brown; antennae white above; fore tibiae white on outer side, the tarsi white. Fore wing bright purple-red irrorated with brown, the medial area tinged with fuscous, the costal edge white except towards base; antemedial line fuscous, oblique to submedian fold, then slightly incurved; postmedial line fuscous slightly defined on outer side by white and slightly incurved in submedian interspace. Hind wing whitish suffused with pale purple-red and fuscous brown; a curved fuscous postmedial line defined on outer side by whitish from costa to vein 1; cilia bright purple-red. Underside grey with pale purplish-red streaks along the veins; both wings with the costal area purple-red to beyond middle and with fuscous postmedial line; fore wing with white scales on the costa.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 3 ♂, 1 ♀ type; PORTUGUESE E. AFRICA, Mt. Chipirone (*Neave*), 1 ♂. *Exp.* 30-32 mm.

(7 b) *Bostra cœnochroma*, sp. n.

Head, thorax, and abdomen pale purplish red thickly irrorated with fuscous; antennæ of male pale red. Fore wing pale purplish red thickly irrorated with fuscous, the costal edge redder; antemedial line rather diffused, black, excurved below costa then slightly incurved; a small black discoidal spot; postmedial line rather diffused, black faintly defined on outer side by whitish in male, and slightly excurved. Hind wing uniform glossy grey-brown with a purplish-red tinge. Underside greyish brown, the costa of fore wing purplish red irrorated with dark brown; hind wing with faint curved dark postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♂, 2 ♀ type; TRANSVAAL, White R. (*Cooke*), 2 ♂. *Exp.* 26-30 mm.

(7 h) *Bostra pallidifrons*, sp. n.

♂. Head white tinged with pale rufous; thorax and abdomen grey-brown mixed with whitish; tibiæ and tarsi whitish tinged with brown. Fore wing dark brown mixed with grey-white; antemedial line diffused, whitish, oblique to median nervure and slightly incurved in submedian interspace; the medial part of costa with white points with black-brown between them; a small blackish discoidal spot; postmedial line diffused, whitish, incurved below vein 4. Hind wing uniform grey-brown. Underside grey suffused and irrorated with brown; fore wing with whitish points on costa with black-brown between them except at base and apex.

Hab. MASHONALAND, Enkeldoorn Distr. (*Miss E. S. Younge*), 1 ♂ type. *Exp.* 14 mm.

(7 j) *Bostra lignealis*, sp. n.

Head and thorax pale brownish red; abdomen whitish tinged with red and irrorated with blackish; legs whitish irrorated with dark brown. Fore wing pale red-brown irrorated with blackish; antemedial line whitish defined on outer side by blackish, almost straight; the medial part of costa with white points with some black between them; a small black discoidal spot; postmedial line whitish defined on inner side by blackish, slightly excurved at discal fold and below submedian fold; cilia with a white line at base. Hind wing pale red-brown irrorated with blackish, an oblique whitish antemedial line defined on outer side by blackish and joined at inner margin by a slightly sinuous whitish postmedial line defined on inner side by blackish; cilia with a white line at base. Underside whitish suffused with red-brown and irrorated with blackish; both wings with sinuous white postmedial line; fore wing with blackish discoidal spot.

Hab. BR. E. AFRICA, Nairobi (*Anderson*), 1 ♂, 1 ♀ type. *Exp.* 20 mm.

(9 a) *Bostra rusinalis*, sp. n.

♂. Head and thorax rufous with a few dark brown scales; abdomen whitish tinged with rufous. Fore wing rufous sparsely irrorated with dark brown, the basal costal area suffused with blackish; traces of a waved dark antemedial line; the medial part of costa with whitish points with dark brown between them; a small dark discoidal spot; postmedial line indistinct, dark, slightly excurved to vein 4 then slightly incurved. Hind wing whitish tinged with rufous, the termen and bases of cilia rather deeper rufous; the underside with the costal area suffused with rufous and irrorated with dark brown.

Hab. GOLD COAST, Appan, 2 ♂ type. Exp. 22 mm.

(10 a) *Bostra pallidicolor*, sp. n.

♂. Head and thorax whitish tinged with pale red and irrorated with a few dark brown scales; abdomen white faintly tinged with red and slightly irrorated with brown; palpi and pectus in front redder. Fore wing whitish tinged with purplish red and irrorated with brown, the red rather deeper on basal costal area and forming diffused streaks in discal and submedian folds; a very faint diffused dark antemedial line angled outwards at submedian fold; a black discoidal spot; postmedial line indistinct, dark, diffused, oblique below vein 4; a terminal series of minute blackish spots. Hind wing ochreous white; a terminal series of slight brown points from apex to vein 2. Underside white; fore wing with the costal area bright rufous with the costal edge white, then tinged with ochreous and irrorated with brown except on inner area; hind wing with the costal area tinged with rufous and irrorated with brown, a blackish spot at upper angle of cell.

♀. Head and thorax greyish tinged with purplish red; abdomen whitish thickly irrorated with brown; fore wing greyish uniformly tinged with purplish red; hind wing suffused with pale reddish brown; underside of fore wing suffused with brown except on costal area, the hind wing tinged with brown and with curved brown postmedial line from costa to submedian fold.

Hab. TRANSVAAL, Pretoria (*Distant, Janse*), 1 ♂, 1 ♀ type. Exp., ♂ 30, ♀ 26 mm.

(10 c) *Bostra dentilinealis*, sp. n.

Head and thorax whitish tinged with red-brown and irrorated with a few black-brown scales; abdomen suffused with fiery red and irrorated with black. Fore wing whitish suffused with pale red-brown, sometimes tinged with olive-green and irrorated with black-brown; an indistinct dentate blackish postmedial line somewhat incurved at submedian fold; a terminal series of black striae; cilia with reddish-brown lines near base and at tips. Hind wing whitish suffused with fiery red and slightly irrorated with brown; a curved dentate blackish postmedial line, rather diffused on inner

side; a terminal series of black-brown bars; cilia with a red line near base. Underside whitish suffused with red and irrorated with dark brown; both wings with slight dark discoidal strizæ and diffused curved dentate postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♂, 3 ♀ type. *Exp.* 24 mm.

(11 a) *Bostra pyrochroalis*, sp. n.

♂. Head, thorax, and abdomen bright fiery red, the antennæ blackish except at base; the frons and palpi whitish, the latter black at tips. Fore wing bright fiery red slightly irrorated with blackish, especially before the antemedial line and on terminal area; antemedial line whitish, excurved below costa, then slightly incurved; postmedial line whitish, slightly excurved beyond the cell, then slightly incurved, both the lines faintly defined by fuscous. Hind wing bright fiery red slightly irrorated with blackish, especially on apical area; faint oblique whitish ante- and postmedial lines slightly defined by fuscous and somewhat approximated towards inner margin. Underside of both wings with blackish discoidal point and curved white postmedial line; fore wing with series of white points on costa to the postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 1 ♂ type. *Exp.* 14 mm.

(10 b) *Bostra flavalis*, sp. n.

♂. Head, thorax, and abdomen yellow with a faint olive tinge; palpi fuscous below; tibiae with the spurs fuscous at base. Fore wing yellow with a faint olive tinge; antemedial line formed by slight black strizæ defined on inner side by white, slightly sinuous; the medial part of costa with black and white points; a slight blackish discoidal striga; postmedial line formed by black scales defined on outer side by white, slightly excurved below costa and at middle and incurved at discal fold and below vein 3; a terminal series of black strizæ; cilia with some blackish at tips. Hind wing yellowish white tinged with fuscous brown; a curved fuscous postmedial line slightly defined on outer side by white; a terminal series of blackish strizæ; cilia with a slight brownish line near base. Underside of fore wing suffused with brown except on inner area to the postmedial line; hind wing irrorated with brown; a curved dark postmedial line.

Hab. FORMOSA, Kanshirei (*Wileman*), 2 ♂ type. *Exp.* 16 mm.

(19 c) *Bostra phaenocraspis*, sp. n.

Head, thorax, and abdomen olive-yellow, the last tinged with crimson at extremity; antennæ whitish tinged with brown; fore and mid tibiae and the hind tibiae at extremity crimson, the fore legs and ventral surface of abdomen except towards base irrorated with brown. Fore wing olive-yellow irrorated with a few red-brown scales; a faint red-brown antemedial line, oblique to sub-

median fold; the medial part of costa with whitish points with blackish between them; a slight brown discoidal striga; postmedial line slight, brown, somewhat oblique to vein 4 and slightly ex-curved above inner margin; a terminal series of black bars; cilia deep crimson at base, then paler crimson with the tips blackish to vein 3. Hind wing olive-yellow; an obscure line formed by brown scales from lower angle of cell to inner margin and a similar slightly curved postmedial line; the terminal area irrorated with a few brown scales; a terminal series of black striæ; cilia deep crimson at base, paler crimson at tips. Underside of fore wing crimson irrorated with black except on costal area to the post-medial line and below vein 3 to termen, the costa with series of quadrate black spots to the postmedial line which is black, ex-curved from below costa to vein 3, then erect, a black discoidal point; hind wing suffused with crimson and irrorated with black to the postmedial line and on apical area, the termen then narrowly crimson, the postmedial line blackish, obliquely curved to vein 2, then sinuous.

Hab. CAMEROONS, Ja R., Bitje (*Bates*), 1 ♂, 2 ♀ type. *Exp.* 22 mm.

(19c) *Bostra phanicoxantha*, sp. n.

♂. Head, thorax, and abdomen whitish suffused with dull purplish red; antennæ ringed with brown; fore legs crimson; pectus, mid and hind legs, and ventral surface of abdomen ochreous. Fore wing brilliant crimson with a yellow medial band except on costal area, defined on inner side by the faint curved crimson antemedial line and on outer by the similar postmedial line ex-curved at middle; a blackish terminal line except towards tornus. Hind wing brilliant crimson, with a broad yellow medial band defined on inner side by the slight curved crimson antemedial line and on outer by the similar postmedial line ex-curved at middle; a black terminal line except towards tornus; cilia whitish at tips. Underside with the crimson paler and duller.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 2 ♂ type. *Exp.* 20 mm.

(21a) *Bostra maculilinea*, sp. n.

Head, thorax, and abdomen white mixed with cupreous red and irrorated with black, the abdomen suffused with black towards extremity; antennæ white ringed with black; fore tibiae and the tarsi black ringed with white. Fore wing cupreous red thickly irrorated with black; some white at base of inner margin; antemedial line white defined on outer side by rather diffused black, slightly waved; the medial part of costa with white points with blackish between them; postmedial line white defined on inner side by diffused black and forming a small white spot at discal fold and larger spot in submedian interspace, slightly waved, ex-curved at middle and incurved in submedian interspace; a black terminal line; cilia white with blackish lines at base and middle

and at tips. Hind wing white tinged with red-brown and, irrorated with fuscous; a curved slightly sinuous white postmedial line; a black terminal line; cilia white mixed with fuscous and with black line near base. Underside of fore wing whitish suffused with fuscous, the costal area chestnut-red to the white postmedial line, the costal edge fuscous with white points; hind wing white tinged with red and irrorated with fuscous, a white postmedial line defined on inner side by black, slightly incurved at discal fold, then excurved.

Ab. 1. Fore wing with the antemedial line obsolescent towards costa, the postmedial line obsolescent at middle.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 8 ♂, 4 ♀ type. Exp. 14-18 mm.

(21 b) *Bostra ignirubralis*, sp. n.

♂. Head, thorax, and abdomen fiery red, the last slightly irrorated with blackish; antennæ whitish tinged with red; palpi and legs deeper red with some blackish mixed, the mid and hind tarsi whitish tinged with red. Fore wing fiery red; antemedial line brown defined on inner side by whitish, very slightly curved; a slight blackish discoidal spot; the medial part of costa with slight white points with black between them; postmedial line fuscous brown defined on outer side by whitish, very slightly curved and slightly incurved at submedian fold; cilia with some fuscous mixed. Hind wing fiery red; an oblique dark antemedial line defined on inner side by whitish, met above inner margin by a curved dark postmedial line defined on outer side by whitish; cilia with some fuscous mixed. Underside paler red irrorated with fuscous brown; fore wing with the inner area whitish, the costal edge dark brown with white points to the indistinct dark postmedial line, a slight dark discoidal spot; hind wing with faint curved dark postmedial line.

Hab. CEYLON (*Mackwood*), 1 ♂ type. Exp. 32 mm.

(5) *Zitha fulviceps*, sp. n.

Head fulvous yellow, the antennæ dark brown ringed with whitish, the palpi suffused with brown except above; thorax dark brown; abdomen, pectus, and legs yellowish suffused with brown. Fore wing glossy fuscous brown; an indistinct blackish discoidal spot; postmedial line indistinct, blackish, excurved below *cysta* and slightly incurved below vein 4. Hind wing glossy fuscous brown. Underside fuscous brown; both wings with indistinct curved dark postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 2 ♂, 1 ♀ type; PORTUGUESE E. AFRICA, Mt. Chipirone (*Neave*), 1 ♂. Exp. 16 mm.

Genus *PHYRGANOMIMA*, nov.

Type, *Phryganodes noctifer*, Dogn.

Proboscis fully developed; palpi upturned, the 2nd joint reaching

to middle of frons, moderately scaled, the 3rd moderate; maxillary palpi triangularly dilated with scales; antennæ of male laminate. Fore wing with the median nervure strongly downcurved towards end of cell, the discocellulars strongly excurved; vein 3 from before angle of cell; 5 from above angle; 6 from upper angle; 7, 8, 9 stalked from before angle; 10, 11 from cell. Hind wing with the cell short; veins 3 and 5 from near angle; 6, 7 from upper angle, 7 not anastomosing with 8.

Genus *LORYMODES*, nov.

Type, *Pyralis diagonalis*, Hmps.

Proboscis fully developed; palpi upturned, the 2nd joint tufted with scales produced to a point in front at extremity, the 3rd long and acuminate; maxillary palpi slightly dilated with scales, antennæ of male with fasciculate cilia, the basal joint long. Fore wing with vein 3 from close to angle of cell; 4, 5 stalked; 6 from upper angle; 7, 8, 9 stalked; 10, 11 from cell. Hind wing with vein 3 from close to angle of cell; 4, 5 stalked; 6, 7 from upper angle, 7 not anastomosing with 8.

(2) *Lorymodes stenopteralis*, sp. n.

Head, thorax, and abdomen white tinged with red-brown; antennæ fuscous except towards base. Fore wing very narrow; whitish suffused with red-brown; a slight brown antemedial mark in submedian fold; the medial part of costa with slight brown points; antemedial line slight, black defined on inner side by whitish, very oblique from costa to the postmedial line at vein 2, then inwardly oblique to inner margin, defining on inner side the postmedial line, which is rather diffused black-brown defined on outer side by whitish, very oblique and slightly curved from costa near apex to submedian fold, then still more oblique to middle of inner margin; a fine brown terminal line; cilia whitish. Hind wing silvery white. Underside of fore wing white, tinged with brown on costal half.

Hab. GAMBIA, 1 ♂; N. NIGERIA, Zungeru (*Macfie*), 1 ♀ type. *Exp.* 16 mm.

Genus *DATTINIA*.

| | Type. |
|---|-------------------|
| <i>Dattinia</i> , Rag. Bull. Soc. Ent. Fr. 1887, p. cxxxvii | <i>syrtalis</i> . |
| <i>Constantia</i> , Rag. Bull. Soc. Ent. Fr. 1887, p. cxxxvii (<i>nec</i> Adams, Moll. 1860) | <i>leonalis</i> . |
| <i>Bulicna</i> , Navas, Bol. Soc. Aragon, x. p. 64 (1913) | <i>leonalis</i> . |

(4c) *Dattinia eumictalis*, sp. n.

♀. Head and thorax yellowish white mixed with rufous, red-brown, and dark brown; abdomen white suffused with red-brown; antennæ white ringed with dark brown; legs white irrorated with brown. Fore wing yellowish white very thickly irrorated with rufous and red-brown and with a few dark brown scales; a whitish

subbasal spot below the cell; antemedial line strong, white, rather oblique to submedian fold and incurved at vein 1; a white spot in end of cell before the blackish-brown discoidal bar; postmedial line black-brown defined on outer side by whitish, incurved below costa, angled outwards at veins 6, 5, 4, then retracted and almost obsolete to below end of cell, then erect, sinuous and more distinctly defined on outer side by white; a terminal series of faint brown spots; cilia chequered red-brown and white. Hind wing white tinged and irrorated with red-brown; a terminal series of slight brown stræ; cilia whiter. Underside silvery white, the fore wing except on inner area and the costal area of hind wing irrorated with red-brown.

Hab. SUDAN, Port Sudan (*Waterfield*), 1 ♀ type. *Exp.* 32 mm.

Genus *ANOBOSTEA*, nov.

Type, *A. discimacula*.

Proboscis present; palpi with the 2nd joint porrect, typically projecting about the length of head, the scaling at extremity below produced to a point, the 3rd obliquely upturned, moderate; maxillary palpi dilated with scales; antennæ of male thickened and with long fasciculate cilia, the basal joint with tuft of scales. Fore wing with vein 3 from angle of cell; 4, 5 typically stalked; 6 from upper angle; 7, 8, 9 stalked; 10, 11 from cell. Hind wing with vein 3 from angle of cell; 4, 5 typically stalked; 6, 7 from upper angle, 7 not anastomosing with 8.

(1) *Anobostea discimacula*, sp. n.

Palpi with the 2nd joint projecting about the length of head; both wings with veins 4, 5 stalked.

Head and thorax purplish red; abdomen grey suffused with brown; antennæ dark brown; pectus, legs, and ventral surface of abdomen pale red irrorated with brown. Fore wing purplish red, irrorated with blackish, the medial area slightly irrorated; antemedial line blackish defined on inner side by pale red, oblique to submedian fold, where it is angled outwards; a series of small blackish spots on medial part of costa; a large black discoidal spot; postmedial line rather diffused, black defined on outer side by pale red, excurved below vein 7 and at middle and incurved at discal fold and below vein 3, a series of slight blackish streaks beyond it on the veins; a terminal series of minute black spots. Hind wing grey suffused with brown; a whitish line at middle of cilia. Underside grey suffused with brown; fore wing with the costa pale reddish with numerous brown stræ.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 2 ♂ type; PORTUGUESE E. AFRICA, Mt. Chipirone (*Neave*), 1 ♀; MASHONALAND, Umtali (*Marshall*), 1 ♀. *Exp.*, ♂ 18-20, ♀ 22-26 mm.

(3) *Anobostra albilinealis*, sp. n.

Palpi with the 2nd joint projecting about twice the length of head; both wings with veins 4, 5 from the cell.

♀. Head, thorax, and abdomen pale red-brown. Fore wing chocolate red-brown with the basal area pale red-brown except towards costa; antemedial line white, rather oblique to median nervure; a series of minute white spots on medial part of costa; postmedial line white, excurved to vein 3, then incurved; cilia greyish brown with a fine whitish line at base. Hind wing pale red-brown mixed with some whitish, the base whiter; a curved whitish postmedial line; cilia greyer brown with a fine pale line at base. Underside red-brown mixed with whitish; fore wing with series of small white spots on costa to the postmedial line, the postmedial line of both wings slightly waved.

Hab. ABYSSINIA, Dirre Dawa (*Drake-Brockman*), 1 ♀ type. *Exp.* 30 mm.

(4) *Anobostra punctilinealis*, sp. n.

♀. Head and thorax deep purple-red mixed with black; abdomen greyish tinged with purple-red and thickly irrorated with black; pectus, legs, and ventral surface of abdomen purplish red mixed with black, the fore tibiae and the tarsi brownish white. Fore wing deep purple-red irrorated with black; antemedial line indistinct, blackish, oblique to just below the cell, where it is angled outwards, then inwardly oblique and defined on inner side by white; the medial part of costa with series of white points; postmedial line indistinct, blackish defined on outer side by white scales and by small spots at discal and submedian folds, minutely dentate, incurved below vein 4; cilia with a fine whitish line at base. Hind wing grey tinged with purplish red and suffused and irrorated with brown, the termen and cilia redder; a faint curved dark postmedial line. Underside dull purplish red irrorated with fuscous brown; fore wing suffused with fuscous brown to the postmedial line except on costal area, a series of white points on basal half of costa; the postmedial line blackish with a slight white mark at costa; hind wing with rather diffused minutely dentate blackish postmedial line.

Hab. BR. C. AFRICA, Mt. Mlanje (*Neave*), 3 ♀ type. *Exp.* 28 mm.

(5) *Anobostra radialis*, sp. n.

♀. Head and thorax red-brown mixed with ochreous. Fore wing greyish suffused with red-brown, especially on basal half and beyond lower angle of cell; antemedial line whitish defined by dark brown on outer side, angled outwards below costa, then obliquely curved and with some black scales before and beyond it at inner margin; some dark rufous suffusion in and below middle of cell; veins 2 to 6 streaked with whitish and defined on each side by

slight dark brown streaks to the postmedial line which is very near termen, white defined by dark brown on inner side, excurved between veins 6 and 3, then oblique and slightly sinuous; a fine brown terminal line; cilia whitish with grey medial band and line near tips. Hind wing yellowish white slightly tinged with rufous especially towards termen; an indistinct curved whitish subterminal line incurved at vein 2; cilia whitish with a slight brown line near base; the underside with the subterminal line more distinct and defined by brown on inner side.

Hab. BR. E. AFRICA, Taveta (*K. St. A. Rogers*), 2 ♀ type; UGANDA, Gondokoro (*Reynes-Coles*), 1 ♀. *Exp.* 30-31 mm.

(1 b) *Tyndis medio-pallens*, sp. n.

Head and tegulae pale reddish, the thorax pale reddish mixed with dark brown; abdomen grey suffused with black-brown, the base whitish, the anal tuft rufous; antennae and palpi irrorated with dark brown; pectus, legs, and ventral surface of abdomen whitish tinged with red-brown and irrorated with dark brown. Fore wing whitish tinged with red-brown and irrorated with dark brown, the medial area much paler except at costa, the basal costal area and a broad shade beyond the postmedial line darker; antemedial line rather diffused dark brown, slightly curved; the medial part of costa with minute greyish spots; a black striga on upper discocellular; postmedial line dark brown slightly defined on outer side by whitish towards costa, very oblique and straight; a terminal series of blackish points except towards costa and line whitish line at base of cilia. Hind wing creamy white slightly irrorated with brown, the terminal area more thickly irrorated; traces of a brown antemedial line from cell to inner margin; a curved brown postmedial line; a brown terminal line and white line at base of cilia. Underside whitish tinged with red-brown and thickly irrorated with dark brown; both wings with small dark discoidal spot and oblique postmedial line.

Hab. BR. E. AFRICA, Nairobi (*Betton*), 1 ♂, Kikuyu, Fort Smith (*Crawshay*), 1 ♂ type, Eb Urru (*Betton*), 1 ♂, Nakuru (*Bodker*), 1 ♂, 1 ♀; GERM. E. AFRICA, Kilimandjaro (*Sjöstedt*), 1 ♂. *Exp.* 26 mm.

(1 c) *Tyndis pallidirufa*, sp. n.

Head and thorax whitish suffused with rufous; abdomen whitish tinged with rufous and irrorated with black, a blackish band on third segment; pectus, legs, and ventral surface of abdomen rufous irrorated with brown. Fore wing whitish suffused with rufous and irrorated with dark brown except on medial area; a rather diffused erect black almost medial line from subcostal nervure to inner margin and a similar oblique postmedial line from below costa to inner margin; a terminal series of minute black spots; cilia with blackish lines near base and tips. Hind wing

whitish suffused with reddish brown; an oblique dark postmedial shade; a dark terminal line; cilia whitish with dark lines near base and tips. Underside creamy white tinged with rufous and irrorated with brown; fore wing with dark discoidal point and suffused oblique postmedial line from below costa to inner margin; hind wing with diffused oblique black postmedial line; both wings with terminal series of minute black spots.

Hab. SIERRA LEONE (*Clements*), 1 ♂, 1 ♀ type. *Exp.*, ♂ 20, ♀ 22 mm.

(6) *Tyndis pyrrhoxantha*, sp. n.

♀. Head and thorax yellow suffused with brilliant fiery red; abdomen yellowish tinged with fiery red and irrorated with fuscous; pectus, legs, and ventral surface of abdomen yellow tinged with red. Fore wing orange-yellow suffused with fiery red and irrorated with black; traces of a yellow antemedial line, oblique to submedian fold and incurved at vein 1; postmedial line rather diffused yellow, excurved at middle and incurved at submedian fold. Hind wing yellow, the inner and terminal areas faintly tinged with red and the latter irrorated with blackish. Underside orange-yellow; fore wing with minute dark discoidal point, the terminal area tinged with red and irrorated with black; hind wing with the apex tinged with red and irrorated with black.

Hab. GOLD COAST, Bibianaha (*Spurrell*), 1 ♀ type. *Exp.* 22 mm.

V.—*The Homoptera of Indo-China.*

By W. L. DISTANT.

Fam. Cicadidæ.

For some time M^r. R. Vitalis de Salvaza has sent me collections of Homoptera from this very interesting region, and I believe he intends at some future date to publish an illustrated work on the insect fauna of Indo-China. The Homoptera already received are from the frontier of Laos, East Annam, and from Lao Kay and Chapa in Tonkin. In this contribution I give a rough list of the species already received, which number fifty-five, belonging to the family Cicadidæ alone. Examples of all these, including types and uniques, are placed in the collection of the British Museum, which, as regards this family, is now by far the largest and most complete in the world.

I also add the descriptions of six new species.

List of Species already received.

| | |
|---|---------------------------------------|
| <i>Platypleura badia</i> , Dist. | <i>Terpnosia posidonia</i> , Jac. |
| — <i>nigrosignata</i> , Dist. | — <i>nadhava</i> , Dist. |
| <i>Tosena melanoptera</i> , White. | — <i>chapana</i> , Dist. |
| <i>Rihana bimaculata</i> , Oliv. | — <i>ransomeli</i> , Dist. |
| <i>Cryptotympana mandarina</i> , Dist. | — <i>rustica</i> , Dist. |
| — <i>holsti</i> , Dist. | — <i>mesonotalis</i> , Dist. |
| <i>Inthacara rex</i> , Dist. | — <i>elio</i> , Walk. |
| <i>Salcacara mirabilis</i> , Dist. | — <i>mawi</i> , Dist. |
| <i>Leptopsaltria phra</i> , Dist. | <i>Calcagninus solcazanus</i> , Dist. |
| <i>Dundubia mamifera</i> , Linn., | <i>Geana vitalisi</i> , Dist. |
| var. <i>terpsichore</i> , Walk. | — <i>maculata</i> , Dru. |
| <i>Cosmopsaltria fratercula</i> , Dist. | — <i>annamensis</i> , Dist. |
| — <i>copaya</i> , Dist. | — <i>sultana</i> , Dist. |
| — <i>andersoni</i> , Dist. | — <i>parici</i> , Nonalb. |
| — <i>toukiniana</i> , Jac. | <i>Balinta pulchella</i> , Dist. |
| <i>Haphsa nana</i> , Dist. | — <i>deluenda</i> , Dist. |
| <i>Platylomia nugarasingna</i> , Dist. | <i>Talinya binghami</i> , Dist. |
| — <i>operculata</i> , Dist. | — <i>distanti</i> , Jac. |
| — <i>rudha</i> , Dist. | <i>Moyania cyanea</i> , Walk. |
| <i>Meinoma microdon</i> , Walk. | — <i>hebes</i> , Walk. |
| — <i>subviridissima</i> , Dist. | — <i>caesar</i> , Jac. |
| — <i>rava</i> , Dist. | — <i>conica</i> , Germ. |
| <i>Pomponia intermedia</i> , Dist. | — <i>indigota</i> , Dist. |
| — <i>fusca</i> , Oliv. | <i>Huechys sanguinea</i> , De Geer. |
| — <i>lactea</i> , Dist. | — <i>tonkinensis</i> , Dist. |
| <i>Aola scitula</i> , Dist. | <i>Scieroptera splendida</i> , Fabr. |
| — <i>bindusara</i> , Dist. | <i>Lemurina apicalis</i> , Germ. |
| <i>Terpnosia erotfooti</i> , Dist. | |

Terpnosia rustica, sp. n.

Head, pro- and mesonotum pale olivaceous green; head with two spots at apex of front and a lateral spot near base of antennæ, two curved central lines on vertex, and a spot above margins of eyes and two small spots between central fasciæ and eyes black; pronotum with two central longitudinal fasciæ which are angulated anteriorly and posteriorly, the furrow behind eyes, and the lateral margins black; mesonotum with central obconical lines which are centrally, posteriorly prolonged, a sublateral line on each side, and a spot near each anterior angle of the basal cruciform elevation black; abdomen above and beneath ochraceous, with the basal margin and apical area black, the basal segments above are also centrally spotted with black; legs and opercula pale olivaceous-green, the latter with black lateral margins, the tarsi ochraceous and apically black; tegmina and wings subhyaline, the first with the veins blackish, the transverse veins at the bases of first, second, and third apical areas with pale brown suffusions and some obscure spots of the same colour on the longi-

tudinal veins to apical areas, costal and post-costal membranes ochraceous; wing-venation blackish; opercula in female short and transverse, subconically oblique, not extending beyond base of abdomen; face conically produced and somewhat strongly laterally striate; base of head at region of ocelli sulcate; pronotum centrally longitudinally sulcate; tympanal coverings both narrower and shorter than tympanal cavities.

Long., excl. tegm., ♂, 15 mm.; exp. tegm. 49 mm.

Hab. Tonkin; Chapa (*R. Vitalis de Salvaza*).

This species may be placed near *T. ransonneti*, Dist.

Terpnosia chapana, sp. n.

♂. Head, pronotum, mesonotum, face, sternum, legs, and opercula olivaceous green; abdomen above and beneath pale testaceous, the abdominal margins a little darker, and the apical abdominal area black; lineate markings to anterior margin of front, a transverse spot near insertion of antennæ, and a suffusion at the region of the ocelli black; pronotum with two central longitudinal linear fasciæ, narrowed and united at base, the furrows, two spots on each lateral area, and the extreme basal margin black; mesonotum with the margins of two anterior obconical spots, followed on each side of anterior margin by a small angulate spot and again by a submarginal longitudinal fascia, a central longitudinal spot reaching middle of cruciform elevation and a spot before each anterior angle of same, black; tegmina and wings subhyaline, the venation black or blackish, tegmina with the costal membrane and post-costal area ochraceous, the transverse veins at the bases of the second, third, and fifth apical areas, and the apices of the longitudinal veins to the apical areas spotted with fuscous; tympanal coverings well developed, but shorter and narrower than tympanal cavities; face centrally sulcate and strongly transversely striate, vertex between the ocelli sulcate; opercula subtruncately oblique, scarcely passing the base of abdomen; greatest width of tegmina about one-third of length.

Long., excl. tegm., ♂, 18 mm.; exp. tegm. 55 mm.

Hab. Tonkin, Chapa (*R. Vitalis de Salvaza*).

The nearest allied species is *T. posidonia*, Jac.

Terpnosia mesonotalis, sp. n.

♂. Head, pronotum, abdomen above and beneath, sternum and legs ochraceous, the upper surface of the

abdomen moderately rufescent; mesonotum uniformly pale ochraceous; pronotum with the sublateral furrow marked with black; the mesonotal cruciform elevation dark testaceous; opercula pale ochraceous; tegmina and wings subhyaline, the veins fuscous; tegmina with the costal membrane and post-costal area dull ochraceous with dark linear markings, extreme basal angle of upper ulnar area dark fuscous; vertex of head sulcate between the ocelli; sublateral furrows to pronotum very profound; face with very strong transverse ridges; tympanal coverings small, very much shorter and a little narrower than tympanal cavities; opercula short and broad, not quite reaching base of abdomen.

Long., excl. tegm., ♂, 17 mm.; exp. tegm. 45 mm.

Hab. Tonkin; Chapa (*R. Vitalis de Salvaza*).

To be placed near *T. madhava*, Dist.

Calcagninus salvazanus, sp. n.

♂. Body and legs ochraceous, mesonotum a little paler, sometimes blackish markings at base of abdomen beneath; tegmina and wings subhyaline, the venation fuscous brown, tegmina with the whole of the costal and subcostal areas ochraceous; tympanal coverings imperfect; abdomen tuberculate beneath on second and third abdominal segments; head about as long as half the width between eyes; wings with six apical areas; mesonotum sometimes with indications of two dark lateral longitudinal fasciæ; opercula wide apart, transverse, not passing basal abdominal segment, apical margins roundly truncate; face with the lateral striations distinct, but not profound; vertex of head narrowly longitudinally sulcate between the ocelli.

Long., excl. tegm., ♂, 15 mm.; exp. tegm. 45 mm.

Hab. Tonkin; Chapa (*R. Vitalis de Salvaza*).

Mogannia indigotea, sp. n.

Body and legs very dark indigo-blue; tegmina and wings hyaline, the venation dark ochraceous; tegmina with about basal half flavescent, outwardly margined with a transverse fuscous fascia and an oblique macular fascia directed inwardly and the basal cell of the same colour, costal membrane dark ochraceous; base of wings narrowly dark ochraceous. Front of head longly hirsute and longly depressed, between the ocelli longitudinally sulcate; pronotum with the furrows profound; rostrum reaching the intermediate coxæ.

Long., excl. tegm., 14-17 mm.; exp. tegm. 34-40 mm.

Hab. Tonkin; Chapa (*R. Vitalis de Salvaza*). N. China (*Brit. Mus.*). Philippine Is.; Malinao, Tayabas (*C. T. Baker*).

A somewhat variable species, allied to *M. effecta*, Dist. In some specimens the basal cell of tegmina is ochraceous, in others the inner and outer dark fasciæ of the basal area are fusc.

Huechys tonkinensis, sp. n.

Head, pronotum, and mesonotum black; vertex of head with almost anterior half, the ocelli and an angulated spot behind them, pronotum with a central, broad, longitudinal fascia which is strongly, medially, angularly compressed, mesonotum with the lateral margins and a medial, longitudinal, anteriorly strongly attenuated fascia sanguineous; face black, apically sanguineous; sternum, opercula in male, body beneath and above sanguineous; legs black; tegmina dark brownish, the venation darker; wings subhyaline, the venation dark brownish; head with the face strongly, centrally, longitudinally sulcate for about two-thirds its length, the transverse lateral striations very coarse; head (including eyes) about as wide as base of mesonotum; head about as long as pronotum; mesonotum (including cruciform elevation) longer than pronotum; tegmina with eight apical areas; opercula in male not passing base of abdomen, well separated, but inwardly obliquely directed; their apices roundly truncate.

Long., excl. tegm., ♂, 18 mm.; exp. tegm. 40 mm.

Hab. Tonkin; Chapa (*R. Vitalis de Salvaza*).

Allied to *H. chryselectra*, Dist., from Borneo.

VI. — Notes on Fossorial Hymenoptera. — XXV. On new Sphecoidea in the British Museum. By ROWLAND E. TURNER, F.Z.S., F.E.S.

Subfamily PHILANTHINÆ.

Cerceris armigera, sp. n.

♀. Nigra; clypeo, mandibulis basi, scapo, fronte sub antennis, segmento dorsali secundo macula basali utrinque, segmentisque quarto quintoque fascia apicali emarginata flavis; vertice macula utrinque pone oculos, pronoto macula utrinque, tegulis, femoribus

anticis, femoribus intermediis apice, tibiis tarsisque anticis intermediisque brunneo-ferrugineis; segmentis dorsalibus secundo, quarto, quintoque omnino, tertioque apice ferrugineis; alis hyalinis, venis nigris; clypeo brevissimo, subporrecto, apice latissime emarginato, angulis apicalibus dente valido armato; mesopleuris haud dentatis; segmento mediano area basali subopaca, delicatissime punctata, segmento ventrali secundo area basali elevata nulla.

Long. 8 mm.

♀. Coarsely and closely punctured; head very broad, the eyes distinctly divergent towards the clypeus; cheeks nearly as broad as the eyes. Antennae inserted rather low down, nearly three times as far from the anterior ocellus as from the base of the clypeus, second joint of the flagellum a little longer than the third. First abdominal segment distinctly broader than long; pygidial area coarsely but rather sparsely punctured, elongate-ovate, rather broadly truncate at the apex. Abdominal segments very strongly constricted, the ventral surface almost smooth. First recurrent nerve received a little before the middle of the second cubital cell, second close to the base of the third cubital cell.

Hab. S. Queensland, Darra near Brisbane (*Hacker*); December.

The shape of the clypeus is remarkable and quite different from any other Australian species.

Cerceris unispinosa, sp. n.

♀. Nigra; mandibulis basi, clypeo, fronte usque ad antennarum basin, scapo, genis late, vertice macula obliqua utrinque, pronoto fascia utrinque, tegulis, scutello macula transversa utrinque, postscutello, segmento dorsali secundo macula transversa basali, tertio fascia apicali-antice late emarginata, quarto fascia angusta apicali, quinto fere omnino, segmentis ventralibus tertio quintoque lateribus, femoribus anticis intermediisque subtus, tibiis tarsisque anticis intermediisque flavis; segmento dorsali secundo dimidio basali, segmentis ventralibus secundo fere toto, tertio in medio, femoribus anticis intermediisque supra, pedibusque posticis ferrugineis; alis hyalinis, apice et cellula radiali infumatis, venis nigris; clypeo plano, apice subemarginato, margine apicali in medio dente nigro parvo armato; mesopleuris haud tuberculatis; segmento mediano area basali subopaca, impunctata; segmento ventrali secundo area basali elevata nulla.

Long. 9 mm.

♀. Strongly and closely punctured; head very broad, eyes distinctly divergent towards the clypeus, antennae inserted about twice as far from the anterior ocellus as from

the base of the clypeus; cheeks very broad, much broader than the eyes; first abdominal segment a little longer than the greatest breadth; pygidial area rugulose, elongate-ovate, rather narrowly truncate at the apex; second ventral segment almost smooth, the other ventral segments sparsely and shallowly punctured.

Hab. S. Queensland, Darra near Brisbane (*Hacker*); December.

Not very near to any other Australian species.

Subfamily *NYSSONINÆ*.

Nysson (*Acanthostethus*) *brisbanensis*, Turn.

Nysson (*Acanthostethus*) *brisbanensis*, Turn. Ann. & Mag. Nat. Hist. (8) xv. p. 81 (1915). ♀.

♂. The male has the ventral segments bare, without a fringe of hairs; ventral segments 3-6 with a small but distinct spine on each side at the apical angles; seventh dorsal segment widely and rather shallowly emarginate at the apex, the angles produced into short blunt spines.

Hab. Brisbane (*Hacker*); February.

Differs from *nudiventris*, Turn., to which species the female is most nearly allied, in the shape of the seventh dorsal segment, which only has two spines (one at each apical angle), also in the presence of a short spine at the apical angles of the sixth ventral segment. The only specimen sent is very small, measuring only 4 mm. in length.

Subfamily *CRABRONINÆ*.

Encopognathus brownei, sp. n.

♀. Nigra, ubique dense rugose punctata; scapo, callis humeralibus, postscutello, femoribus apice extremo, tibiis tarsisque pallide flavis; tibiis intermediis posticisque infra fuscis; alis hyalinis, iridescentibus, venis fuscis, stigmate testaceo.
Long. 5 mm.

♀. Mandibles excised on the outer margin, acute at the apex. Clypeus subcarinate longitudinally, produced into two porrect teeth at the apex, with a smaller tooth on each side near the apical angles. Eyes not hairy, the facets in front larger than elsewhere, separated from each other at the base of the clypeus by a distance equal to about half the length of the scape; frontal groove smooth and shining. Posterior ocelli a little nearer to the eyes than to each other, the ocellar region and the vertex coarsely punctured-rugose,

an oblique groove from the eyes to the posterior ocelli; the hind margin of the head slightly raised, subcarinate. Pronotum transverse, the anterior margin raised and sharply pointed at the angles; thorax very coarsely punctured, the mesopleuræ coarsely rugose. Median segment short; with a distinct enclosed basal area, which is very finely rugulose, with five strong longitudinal carinæ; the posterior slope rather indistinctly transversely striated; the sides of the segment very finely and closely punctured. Abdomen smooth and shining beneath, the three basal dorsal segments coarsely punctured, the three apical segments closely and finely punctured. Recurrent nervure received before the middle of the cubital cell; transverse cubital nervure received just beyond the middle of the radial cell.

Hab. British East Africa, Tana River, 3000 ft., near Mt. Kenia (*G. Orde Browne*); November.

This is distinct both in colouring and in structural details from *E. braueri*, Kohl.; also in the sculpture of the abdomen.

Rhopalum tuberculicorne, sp. n.

♂. Niger; scapo, tuberculis humeralibus, pedibus anticis, pedibus intermediis tarsis infuscat, coxisque posticis apice flavis; flagello fusco subtus ferrugineo; segmentis dorsalibus 5-7, ventralibus 2-7, tibiis posticis tegulisque pallide ferrugineis; alis hyalinis, iridescentibus, venis nigris, cellula radiali infuscata. Long. 4 mm.

♂. Clypeus without a carina, clothed with silver pubescence, the apical margin almost transverse. Mandibles blunt at the apex, not bidentate. Second joint of the flagellum longer than the third, emarginate at the base beneath and produced into a stout tubercle at the apex beneath. Head smooth and shining; the eyes separated at the base of the clypeus by a distance slightly exceeding the length of the scape, strongly divergent towards the vertex; posterior ocelli as far from the eyes as from each other, and also as far from the hind margin of the head as from each other, a short longitudinal sulcus between them. Pronotum short, a minute spine at the anterior angles. Thorax shining, microscopically punctured; median segment smooth and shining. First abdominal segment scarcely longer than the second, moderately swollen at the apex, second segment broadened from the base, third segment broader than long. Hind tibiae broad, with a few small spines on the outer margin. Recurrent nervure received just before two-thirds from the base of the cubital cell; radial cell broadly truncate at the apex,

the costal margin shorter than the stigma, the transverse cubital nervure received a little beyond one-quarter from the base of the cell.

Hab. S. Queensland, Caloundra (*Hacker*) ; January.

Nearly related to *R. tenuiventris*, Turn., but the abdomen is more slender in that species, the third segment being much longer than broad ; in *tenuiventris* ♂ the scape has a small spine at the apex, the second joint of the flagellum is rather more strongly emarginate beneath, and the third joint is also strongly emarginate beneath and subtuberculate at the apex. The epinemial area is defined in both species. In most Australian species of *Rhopalum* the male antennæ are not strongly differentiated, but in *R. aliciae*, Turn., and *R. leptospermi*, Turn., the third joint of the flagellum is strongly emarginate beneath and subtuberculate at the apex.

Rhopalum testaceum, sp. n.

♀. Testacea ; capite mesonotoque nigris ; mandibulis, apice excepto, clypeoque flavis ; antennis testaceis ; alis hyalinis, iridescentibus, venis fuscis.

Long. 4 mm.

♀. Mandibles acute at the apex, not bidentate ; clypeus broadly rounded at the apex, with four minute teeth on the apical margin, without a carina. Head smooth and shining ; the eyes separated at the base of the clypeus by a distance equal to rather more than two-thirds of the length of the scape ; posterior ocelli as far from the eyes as from each other and about the same distance from the hind margin of the head ; a curved groove from the inner margin of the eye, extending towards, but not reaching, the posterior ocelli. Pronotum depressed below the mesonotum, almost vertical. Thorax closely and minutely punctured, a transverse groove at the base of the scutellum. Median segment smooth and shining, with a distinct median sulcus. First abdominal segment a little shorter than the second, moderately swollen at the apex, not very slender ; second segment longer than the apical breadth ; third segment much broader than long. Hind tibiae very feebly serrate near the apex. Recurrent nervure received a little before two-thirds from the base of the cubital cell ; radial cell oblique at the apex, the costal margin as long as the stigma, the transverse cubital nervure received just beyond one-quarter from the base of the cell.

Hab. N. Queensland, Kuranda (*F. P. Dodd*).

Easily distinguished by the remarkable colouring. The first abdominal segment is shorter than in other Australian

species except *frenchi* and *macrocephalus*, and the hind tibiae are much less swollen than is usual in the genus.

Subfamily *TRYPOXYLONINÆ*.

Pison deperditum, sp. n.

♀. Nigra; mandibulis, palpis, antennis, abdomine pedibusque rufo-ferrugineis; tegulis testaceis; alis hyalinis, venis fuscis; segmento mediano crasse rugoso, sulco mediali lato, transverse striato.

Long. 7 mm.

♀. Clypeus broadly rounded at the apex, clothed with whitish pubescence, which extends on to the front. Second joint of the flagellum about equal to the third, nearly twice as long as the first. Eyes separated at the base of the clypeus by a distance equal to nearly twice the length of the scape, and by about the same distance on the vertex; posterior ocelli a little further from each other than from the eyes, separated from each other by a distance equal to the diameter of one of them, with a shallowly impressed transverse line behind them. Front with a low carina from the base of the antennæ reaching halfway to the anterior ocellus. Pronotum transverse, with a narrow depression along the hind margin; thorax smooth, opaque. Median segment very coarsely rugose-reticulate, with short oblique striæ at the base, and a very wide transversely striated longitudinal sulcus, the posterior slope irregularly transversely striated. Abdomen microscopically punctured, the segments broadly but very shallowly depressed on the apical margin. First recurrent nervure received just before the apex of the first cubital cell, second received close to the middle of the second cubital cell; third cubital cell on the radius very short, shorter than the petiole of the second cubital cell.

Hab. Port Darwin, Northern Territory (*G. F. Hill*).

This is very closely allied to *P. ruficornis*, Sm., from which, however, it is easily distinguished by the very different and much coarser sculpture of the median segment. The venation in both species is that of the section *Pisonitus*, Shuck.

Pison multistrigatum, sp. n.

♀. Nigra; palpis testaceis; calcaribus unguiculisque ferrugineis; alis hyalinis, apice leviter infumatis, venis fuscis; segmento mediano fortiter longitudinaliter striato.

Long. 9 mm.

♀. Clypeus broadly truncate at the apex, clothed with silver pubescence. Head opaque, finely punctured; eyes separated at the base of the clypeus by a distance about equal to three times the length of the scape, but by only about half that distance on the vertex; second joint of the flagellum distinctly longer than the third and about twice as long as the first; posterior ocelli about twice as far from each other as from the eyes. Thorax subopaque, finely and closely punctured; the pronotum transverse, a little depressed on the posterior margin. Median segment very coarsely longitudinally striated; the sides of the segment finely horizontally striated, with fine punctures between the striæ; posterior slope transversely striated, with a deep median sulcus. Abdomen shining, very finely punctured, the segments rather feebly depressed at the apex; second ventral segment more sparsely punctured in the middle than on the sides; the apical angles of the dorsal segments with a little white pubescence. First recurrent nervure received close to the apex of the first cubital cell, second at the apex of the second cubital cell, almost interstitial with the second transverse cubital nervure. Third cubital cell shorter on the radius than the petiole of the second cubital cell.

Hab. Nvasaland, Mlanje (*S. A. Neave*); February.

Differs from all other species known to me by the very strong longitudinal striation of the median segment.

Pison strigulosum, sp. n.

♀. Nigra; fronte argenteo-pubescente; mandibulis, femoribus apice, tibiis tarsisque ferrugineis; tegulis testaceis; alis hyalinis, iridescentibus, venis nigris, segmento mediano basi oblique, apice transverse striato.

Long. 8 mm.

♀. Clypeus without a carina, broad, the apical margin slightly oblique on the sides and forming a distinct angle in the middle. Head opaque, a distinct frontal sulcus reaching the anterior ocellus. Front broad, the eyes at the base of the clypeus more than half as far again from each other as on the vertex. Posterior ocelli nearer to the eyes than to each other; second joint of the flagellum distinctly longer than the third. Thorax minutely and closely punctured, the pronotum and mesopleuræ clothed with short silver pubescence. Median segment obliquely striated at the base, the striæ becoming rather finer and more transverse towards the apex, the apical slope coarsely transversely striated; at the base of the segment is a very small triangular space enclosed

by sulci; from the apex of the triangle a longitudinal transversely striated groove runs to the apex of the segment, and is continued after a narrow interruption on the apical slope. Abdomen finely punctured, somewhat pubescent, the three basal segments shallowly depressed on the apical margin; second ventral segment microscopically punctured, more finely than the third; second to fourth ventral and third to fifth dorsal segments very narrowly pale testaceous at the apex. Third cubital cell as long on the radius as the petiole of the second cubital cell; recurrent nervures received just before the first and second transverse cubital nervures.

Hab. Gold Coast, Tamale (*Dr. C. E. S. Watson*).

This belongs to the group of *P. xanthopus*, Brullé, but may be distinguished by the less oblique striation of the median segment, the colour of the pubescence on the front, and the shape of the clypeus.

Pison carinatum, sp. n.

♀. Nigra; mandibulis in medio fusco-ferrugineis; calcaribus pallide testaceis; alis hyalinis, margine apicali leviter infuscatis; fronte argenteo-sericeo, abdomine segmentis dorsalibus 1-3 margine apicali albidio pubescentibus.

♂. Feminae similis; tarsi rufescentibus; segmentis abdominalibus 4-7 rufis; segmento dorsali septimo lato, deflexo, apice subtruncato.

Long., ♀ 7, ♂ 6 mm.

♀. Clypeus with a low longitudinal carina on the basal half, broadly subtruncate at the apex. Head opaque, with a delicate longitudinal sulcus on the front reaching to the anterior ocellus. Eyes more than half as far again from each other at the base of the clypeus as on the vertex; posterior ocelli a little nearer to each other than to the anterior ocellus, further from each other than from the eyes; second joint of the flagellum a little shorter than the third. Thorax closely and minutely punctured, more strongly on the mesopleurae than on the mesonotum; median segment finely obliquely striated, depressed longitudinally in the middle, with a distinct longitudinal carina, the apical slope transversely striated, the sides of the segment finely and closely punctured. Abdomen on both surfaces closely and microscopically punctured; sixth dorsal segment broadly triangular, convex, subcarinate longitudinally in the middle. The position of the recurrent nervures and also the length of the third cubital cell on the radius show much variation in this species.

The male has the clypeus more produced in the middle

than in the female, but has the carina at the base; the eyes are a little further apart on the vertex, the second joint of the flagellum is fully as long as the third. The broad form of the seventh dorsal segment is remarkable.

Hab. Ashanti, Obuasi (*W. M. Graham*), April, February; Uganda, Entebbe (*C. G. Gowdey*) (type), September and March; Egypt, Meadi (Egyptian Department of Agriculture), July; Sierra Leone (*Morgan*).

I had identified this species as *xanthopus*, Brullé, in my recent paper on *Pison* (Proc. Zool. Soc. 1916), but since then have found other specimens answering much better to Brullé's description. The present species may possibly be *obscurus*, Shuck., but the type of that species is lost and the description gives the pubescence of the front as golden, as in *xanthopus*.

Pison xanthopus, Brullé.

Nephridia xanthopus, Brullé, Ann. Soc. Ent. France, ii. p. 408 (1833).
♀.

Four females in the National Collection answer well to the description. They differ from *carinatum* and *strigulosum* in the bright golden pubescence of the front and in the red colour of the two or three apical abdominal segments. There is no basal carina on the clypeus as in *carinatus*, which it resembles in the sculpture of the median segment, and differs in the latter point from *strigulosum*. The clypeus is more distinctly truncate at the apex than in either of the other species. *P. clypeatus*, Cam., seems to belong to the same group. I do not think that Shuckard's description of *obscurus* can be meant for the present species.

Hab. N. Nigeria, Kateri (*J. J. Simpson*), December; Gold Coast, Aburi (*L. Armstrong*), April.

Pison flavolimbatus, sp. n.

♀. Nigra; segmentis dorsilibus tribus basalibus fascia apicali flavidula; scapo tegulisque brunneo-testaceis; fronte, pronoto segmentoque mediano lateribus pallide aureo-pubescentibus; alis subhyalinis, costa late infuscata, venis nigris.
Long. 10 mm.

♀. Clypeus convex, broadly truncate at the apex, without a carina; head opaque, a distinct frontal sulcus reaching to the anterior ocellus; eyes a little further apart at the base of the clypeus than on the vertex, posterior ocelli as near to each other as to the eyes; an undulating, low, transverse ridge separating the anterior from the posterior ocellar

region. Second joint of the flagellum slightly longer than the third. Thorax opaque, minutely and very closely punctured; median segment similarly punctured, with a median longitudinal sulcus, shallow and narrow on the dorsal surface, deep and broader on the posterior slope, the extreme apex with a few transverse striæ. Abdomen closely and minutely punctured, rather more strongly on the ventral than on the dorsal segments; sixth dorsal segment triangular, convex. Both recurrent nervures received by the second cubital cell, the first near one-quarter from the base, the second very near the apex; radial margin of the third cubital cell variable in length, but longer than the petiole of the second cubital cell.

Hab. British Guiana, Issororo (*C. B. Williams*); July. Three females.

The development of the yellow abdominal fasciæ, which are chitinous, varies considerably, being rather obscured in one specimen. This is quite distinct from *P. paraense*, Spin., which also has yellowish abdominal fasciæ, but is much smaller and is without the broad fuscous costal margin of the fore wing, and differs in other details of colour, also in the position of the first recurrent nervure.

VII.—*On the External Characters of the Felidæ.* By
R. I. Pocock, F.R.S., Superintendent of the Zoological
Society's Gardens.

THE facts recorded in this paper are based upon an examination, extending over many years, of specimens that have died in the Zoological Society's Gardens. Although unavoidably incomplete, the observations probably, I think, cover the range of variation in the characters discussed within the limits of the family.

The Ears.

The ears of the Felidæ are very constant in their general features, so far as my observations have carried me, and do not differ essentially from those of the typical Viverridæ. The *bursa* is always present and large. Its posterior flap rises behind the rim of the pinna above, and the anterior flap is always deeply notched. These features are observable even in newly-born kittens. The main cartilages also differ but little from species to species; but neither in the structure of the bursa nor of the cartilages have I been able to establish

any features of systematic value. A more detailed comparison than I have made may, however, show that such differences

Fig. 1.



A. Left ear of *Felis rufus esquinape*, nat. size.
 B. " " *jaguarondi*, " "
 C. " " *salinarum*, " "

exist. For instance, in *F. eyra* the excrescence on the antero-internal ridge overlapping the anterior end of the supratragus (*plica principalis*) is rather unusually well developed.

Usually the ears are rounded at the summit, but in the species of the genus *Felis* (s. s.), e. g. *F. sylvestris*, *ocreata*, *chaus*, and their allies, and also in the lynxes, *F. lynx*, *ruffus*, *caracal*, they are more angular and pointed. In all the lynxes, moreover, the tip is provided with a pencil of hairs, which are especially well developed in *F. caracal* and smallest in *F. ruffus*. In the latter they are sometimes temporarily absent during the moult; but they are never absent in *F. caracal*. That these ear-tufts cannot be regarded as a generic feature is shown by the frequent presence of similar but smaller tufts in *F. ocreata*, *F. chaus*, and *F. ornata*.

Of all the species known to me, *F. jaguarondi** and *F. manul* have relatively the smallest and least conspicuous ears. In the former their smallness, coupled with the general shape of the narrow head, imparts a decidedly musteline physiognomy to the species. In *F. manul* the width of the head and the height of the forehead make the ears appear to be set very low behind the cheek, and they certainly are never raised above the summit of the head when pricked†. *F. serval* presents the greatest possible contrast to *F. manul* in this particular, the ears being large and capable of being closely juxtaposed on the top of the head when pricked. In no other species is this power developed to the same extent.

The ear of *Acinonyx* conforms in shape and structure to that of other round-eared members of the family Felidæ (Ann. & Mag. Nat. Hist. (8) xviii. pp. 422-423, fig. 2 A, 1916).

The Rhinarium.

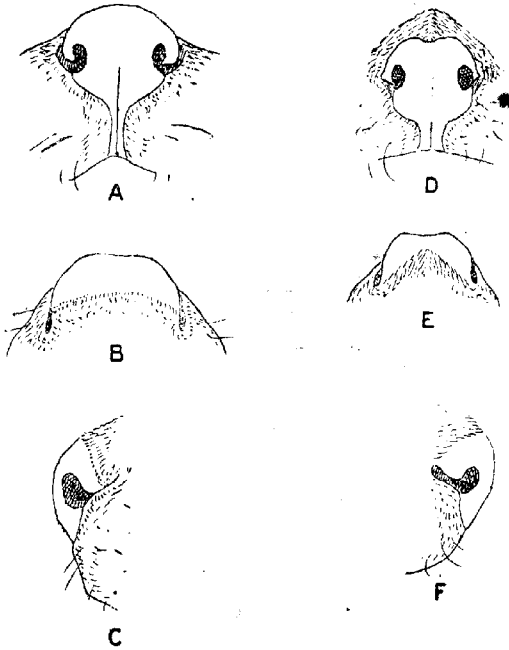
The muzzle of the Felidæ differs from that of the Viverridæ, Cryptoproctidæ, Mungotidæ, and their allies in being bluntly truncated, the nose, that is to say, projects to a comparatively slight extent beyond the lower jaw. This feature, coupled with the shortness of the jaws, gives a very characteristic appearance to the face of the Felidæ as compared with that of other Æluroids in which the muzzle noticeably recedes from the anterior edge of the prominent rhinarium to the sloping chin. There is, however, a certain amount of variation in the Felidæ with respect to this character. In all species, it may be added, the upper lip is cleft by a laterally distensible and mesially grooved strip of naked skin, confluent above with

* If *F. braccata*, Cope, as stated, has pointed ears, it is probably not related to *F. jaguarondi* as claimed by its describer.

† So far as my memory serves, the ears in *F. manul* are rounded and not angular, as one would expect from the affinity of this species to typical *Felis* and to the lynxes.

In the genus *Felis* (s. s.), as exemplified by *F. sylvestris* and *F. ocreata*, the rhinarium is comparatively small, exhibiting from the dorsal view a very narrow naked area beyond the hair of the summit of the muzzle. Viewed from the front,

Fig. 3.



- A. Rhinarium of *Felis pardalis*, from the front.
 B. " " " from above.
 C. " " " from the side.
 D. " " *jaguarondi*, from the front.
 E. " " " from above.
 F. " " " from the side.

its upper edge is horizontal with a slight median depression and rounded angles. The median portion below the level of the nostrils, which are moderately far apart, is acutely angled inferiorly, and there is no definite strip extending laterally beneath the nostrils. The rhinarium of an example of

F. ocreata from Somaliland differs from that of an example of *F. sylvestris* from Scotland in having the area between the nostrils and the angular portion immediately below it rather narrower (fig. 2, A, B, C).

The lynxes (*F. caracal*, *F. rufus esquinapæ*, and *F. lynx isabellinus*) have the rhinarium relatively larger and more prominent than *F. sylvestris* and *F. ocreata*, the naked portion seen from above being less overgrown by the hair of the muzzle. Otherwise there is no great difference between them. In an example of *F. lynx isabellinus* the upper margin seen from the front is more convex than in *F. caracal* and in *F. rufus esquinapæ*, and the nostrils are somewhat larger, possibly in adaptation to a life at high altitudes, where the atmosphere is more rarified (fig. 4, C).

In the smaller tropical and subtropical Felidæ of America the rhinarium is large as compared with that of *F. ocreata* and *F. sylvestris*, as may be seen by comparing the drawings of this organ in a specimen of *F. ocreata* from Somaliland and of *F. salinarum* from Cordova in the Argentine, the cats themselves being approximately equal in size. In the case of *F. salinarum** the rhinarium exhibits a naked area of considerable size when seen from above, the nostrils are wider apart than in *F. ocreata*, and the infranarial portion is wider transversely and much less acutely angled inferiorly (fig. 2, B, C, & G, H, I).

In *F. wiedii* the rhinarium is very similar to that of *F. salinarum*.

In an example of *F. pardalis* (fig. 3, A, B, C) from Mañaos the rhinarium is rather more prominent than in examples of *F. wiedii* examined, and has the internarial septum wider, the edge more convex in profile view, and the upper edge also more convex when viewed from the front. Nevertheless, the general similarity between them is unmistakable.

In an adult *F. jaguarondi* (fig. 3, D, E, F) from Cordova, in the Argentine, the muzzle projects, and the hairs on its summit form a high crest, which anteriorly encroaches in the middle line on the rhinarium, forming an angular projection over the middle of its upper side. In profile view the margin is convex. From the front view the upper edge is mesially notched by the hairy crest, the internarial septum is broad, and the portion below the nostrils deep. But in a young specimen of the typically coloured form of this species

* This form, described by Mr. Thomas (Ann. & Mag. Nat. Hist. (7) xii. p. 239, 1803), is closely related to the better-known *F. geoffroyi*. Possibly it should be regarded merely as a subspecies.

these characteristics of the rhinarium observed in the adult *cyra*-coloured specimen from Cordova are less marked*.

I have only examined the rhinarium in two of the tropical Asiatic species, namely *F. viverrina* and *F. nebulosa*. In the former the rhinarium is tolerably similar to that of *F. pardalis*, but is relatively smaller and less prominent. In *F. nebulosa*, on the other hand, it differs but little from the rhinarium of *Panthera* † described below.

In the matter of prominence and the great size of the the naked area, when viewed from above, the rhinarium of *F. serval* (fig. 2, D, E, F) surpasses that of all other species of Felidæ. From the dorsal aspect it is broadly cordate. In profile view its margin is rather strongly convex and projects well beyond the lips. From the front its superior edge is transverse, with rounded angles; the portion above the nostrils is high, and the area below them wide, comparatively deep, and not acutely angled inferiorly. The rhinarium, indeed, is an exaggeration of the type seen in *F. pardalis*. The differences between it and the rhinarium of *F. ocreata* and *sylvestris* are particularly worthy of note.

In an example of *F. concolor*, three months old, the rhinarium seen from above exhibits a tolerably extensive naked tract, although not so large as that of *F. pardalis*. Nor is the rhinarium so convex and prominent in profile view as in that species. Moreover, from the front aspect the area above the nostrils is deeper, that below them is narrower, and the nostrils themselves are closer together.

The rhinarium, it may be noted, is not like that of *Panthera*, but in its general features approaches the rhinarium of the smaller members of the Felidæ.

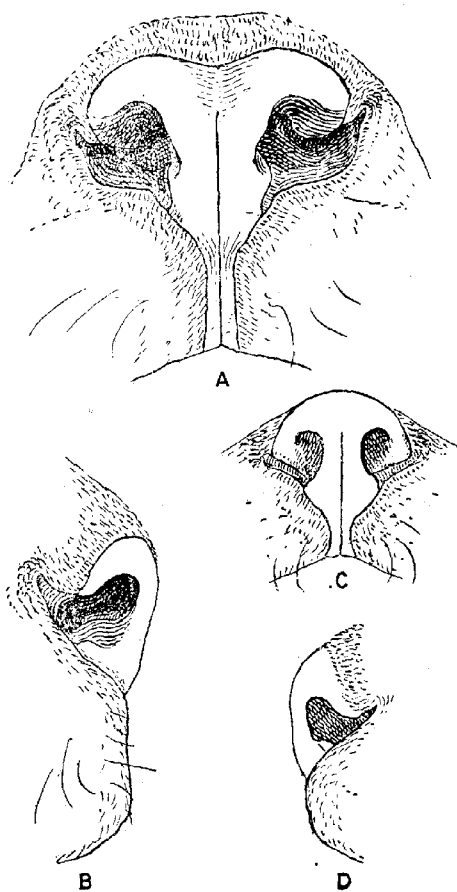
In *Panthera leo* (fig. 4, A, B) the short hair of the muzzle spreads over the summit of the rhinarium practically to its anterior margin, so that there is no naked area, or at most a very narrow naked area, visible in front of the hair from the dorsal view. The rhinarium itself is tolerably flat, the median area below the level of the nostrils is narrow and acutely angled inferiorly, and there is no definite lateral infranarial extension, the naked skin forming the lower margin of the nostril being quite smooth and moist like the inside of that orifice, which is large and expanded.

So far as my observations go, the rhinarium of *P. tigris*,

* In the description of *F. braccata*, Cope records the angulation of the muzzle-hairs in *F. jaguarondi* (Amer. Nat. xxiii. p. 144, 1889).

† For the recognition and definition of this genus, see Ann. & Mag. Nat. Hist. (8) xviii. pp. 221-229 & 306-316 (1916).

Fig. 4.



- A. Rhinarium of *Panthera leo*, from the front.
 B. " " " " from the side.
 C. " " *Felis lyar*, from the front.
 D. " " " " from the side.

onca, and *pardus* agrees with that of *P. leo*. The rhinarium of *Uncia uncia* I do not know.

The foregoing account of the range of variation in the structure of the rhinarium in the Felidæ, and a comparison between that organ in the Felidæ and in genera referred to the Viverridæ, show that there is practically a complete gradation between the two.

In *Civettictis civetta**, for example, the rhinarium, which is of the same type as the rhinarium of *Paradoxurus* and of *Mungos*, is very large and prominent, with the infranarial portions deep and extending laterally beyond the nostrils. But in *Genetta* the infranarial portions are reduced in size; and in *Linsang*† they are so much reduced as to be only a little larger than in some of the Felidæ—e. g., *F. pardalis*, *F. eyra*, and *F. serval*, which also have the rhinarium tolerably prominent and naked above. The difference, indeed, between the rhinaria of *Linsang* and of *Civettictis* is greater than between the rhinaria of *Linsang* and *F. pardalis*; and from the prominent rhinarium, with its naked upper side, of *F. pardalis*, gradations may be traced within the Felidæ to the wide, comparatively flat rhinarium, with hairy upper side and suppressed infranarial areas, of *Panthera leo*, the species which, with its allies, has the highest type of rhinarium met with in the Æluroidea.

The Facial Vibrissæ.

Amongst the Æluroid Carnivores, as I have already shown, the Felidæ are exceptional for the complete absence of the interramal tuft of tactile vibrissæ. At all events, I have never found a trace of this tuft in any specimen of the many species that have passed through my hands. For the rest, there is nothing particularly noteworthy about the facial vibrissæ. The mystacial and superciliary tufts are always well developed. The two genal tufts occupy the normal position on each cheek, the lower being placed in a line with the corner of the mouth, and the upper a little higher up and a little farther back than the lower. In species with short hair on the cheeks each tuft consists usually of two or three long vibrissæ and is very conspicuous, e. g. *Panthera pardus* and *F. caracal*. But sometimes there is a reduction in the number. Of two specimens of *F. wiedii*,

* P. Z. S. 1915, p. 396.

† Ann. & Mag. Nat. Hist. (8) xvi. p. 341, pl. xii. fig. 5 (1915).

for instance, one had three bristles to each tuft, the other only one—a difference I suspect to be due to moulting. On the other hand, in species with long hair or copious whiskers on the cheek, like *Panthera tigris* and *Felis lynx*, these vibrissæ are not always easy to find. In an example of the Tibetan lynx, *F. lynx isobellina*, for instance, each of the genal tufts was represented by a single bristle mixed up with the fringe on the cheek. Similarly, in examples of *F. sylvestris* and of *F. ocreata*, recently examined, each the genal tufts was represented by a single bristle.

The Feet.

In the 'Annals and Magazine of Natural History' (8) xviii. pp. 419–429 (1916), in a paper dealing with the external characters of the hunting leopard or cheetah (*Acinonyx jubatus*), I described the feet of that Feline, and compared them with those of the common leopard (*Panthera pardus*) to show the differences between them and to illustrate the range of structural variation in the feet within the limits of the family Felidæ. I stated that the feet of *Acinonyx* are distinguished from those of all the other members of that family by the complete absence of cutaneous sheaths for guarding the claws; but added that the feet of the typical Felidæ by no means always conform to the Pantherine type in the degree of development of these sheaths. In the following pages I have described and figured the feet* of several species from the Old World and the New to show how they differ from each other. Since the selection is tolerably wide, it does not appear to me probable that any species of cat exists with feet differing in any important respect from all of those here discussed; but a few interesting species, like *F. manul*, *pajeros*, and *planiceps*, still remain to be done.

Since in their main characters the feet here described agree with those of *Panthera pardus*, it is needless to repeat what was said on that head in the paper above quoted †.

* The drawings have been taken from measured feet with the hairs surrounding the pads cut short, and the feet are represented as naked with the digits spread, the axes of digits 2 and 5 being approximately at right angles.

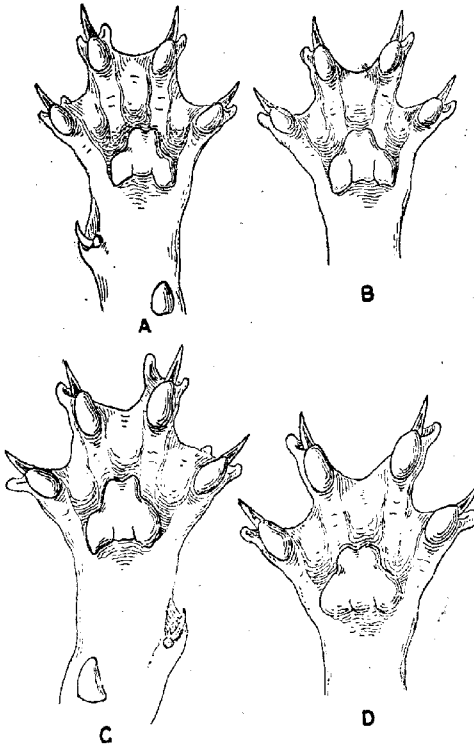
† Apart from the forms assigned to *Panthera*, a genus which I have elsewhere defined, all the species are provisionally referred to the genus *Felis*.

Genus FELIS, Linn.

Feet of some European, African, and Asiatic Species.

*Felis sylvestris**.—The feet are comparatively narrow for

Fig. 5.



- A. Left fore foot of *Felis sylvestris*. $\times \frac{1}{3}$.
 B. " hind foot of " " "
 C. Right fore foot of *Felis serval*. "
 D. " hind foot of " " "

their length, with smallish pads. In the fore foot the

* It is appropriate to begin with this species, because it is closely related to, and probably one of the agriotypes of, the domestic cat, *Felis catus*, the type of the genus *Felis*. The feet of the two are similar. The examples of *F. sylvestris* examined came from Scotland.

second and third digits are provided with inner lobes to the claw-sheaths, that of the third being larger than that of the second. There is, however, no distinct inner lobe to the claw-sheaths of the fourth and fifth digits. The webs are moderately well developed. In the hind foot the digits are without inner lobes to the claw-sheaths, or, at all events, these lobes are so small as to be negligible (fig. 5, A, B).

F. ocreata has feet almost precisely like those of *F. sylvestris*.

Felis serval.—The feet in a general way resemble tolerably closely those of *F. sylvestris*, except that the sheaths of the claws are relatively a little larger, the inner lobe of the third digit in the specimen examined being exceptionally well developed and larger than the outer lobe. The carpal pad also is relatively larger (fig. 5, C, D).

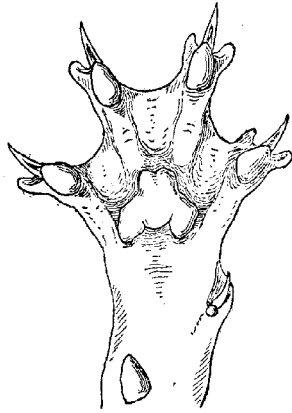
Felis caracal.—The fore foot is tolerably similar to that of *F. sylvestris*, but the digits are more separable, the claw-sheaths somewhat larger, and the webs, particularly those joining the second and third and the fourth and fifth digits, shallower and more emarginate. In the hind foot the third digit carries a well-developed inner lobe to the claw-sheath, the plantar pad is longer as compared with its width than in *F. sylvestris*, and the webs are much shallower, especially that connecting the third and fourth digits. The digital pads, also both of the fore and hind foot, are more pointed distally than in *F. sylvestris* and *F. serval* (fig. 6, A, B).

As I have already remarked (Ann. & Mag. Nat. Hist. (8) xviii. p. 429, 1916), the hind feet of *F. caracal* recall those of *Acinonyx jubatus* in the emargination of the webs.

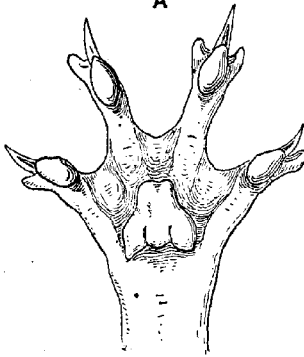
Felis lynx isabellinus (fig. 7, C, D).—The feet differ in some interesting particulars from those of *F. caracal*. In the fore foot the plantar pad, owing to the encroachment of the surrounding hair, is shorter as compared with its width; the webs are deeper and hardly differ in development from those of *F. sylvestris* and *F. serval*; the claw-sheaths are exceedingly well developed on the second and third digits, the inner lobe of the third being approximately as large, relatively, as in *F. serval*, and there is a distinct inner lobe on the fourth and fifth digits, that of the fourth being large, that of the fifth smaller but distinct. In the hind foot the plantar pad is longer for its width than in the fore foot, but not so long as in *F. caracal*. The webs are rather more emarginate than in *F. sylvestris* and *F. serval*, but not nearly so shallow as in *F. caracal*. As in the fore foot the claw-sheaths are complete on all the digits,

the second, fourth, and fifth carrying an inner lobe as well as the third, that of the fifth being the smallest.

Fig. 6.



A



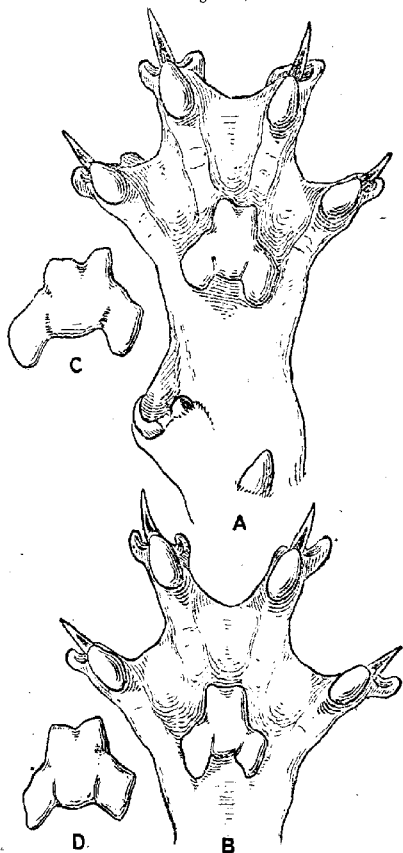
B

- A. Right fore foot of *Felis caracal* (young). $\times \frac{1}{3}$.
 B. „ hind foot of „ „ „ „

Felis viverrina.—The feet are shorter and broader than in the previously-described species, and in the example examined

the carpal pad was exceedingly small. The claw-sheaths are moderately well developed, but the inner lobe of the second

Fig. 7.



A. Left fore foot of *Felis ruffus esquinapæ*. $\times \frac{1}{2}$.

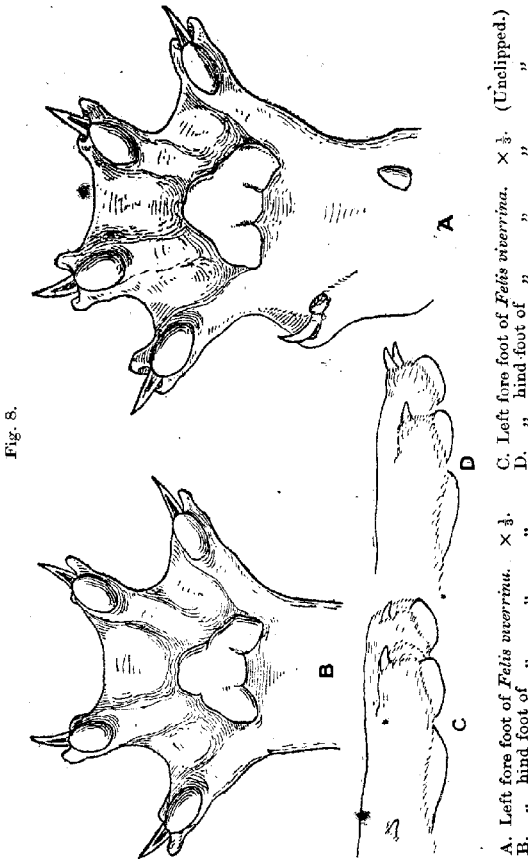
B. " hind foot of

C. Plantar pad of right fore foot of "*Felis lynx isabellinus*". $\times \frac{1}{2}$.

D. " " hind foot of " " "

of the fore foot is comparatively large, and there is a small inner lobe on the fourth and fifth. Similarly, in the hind

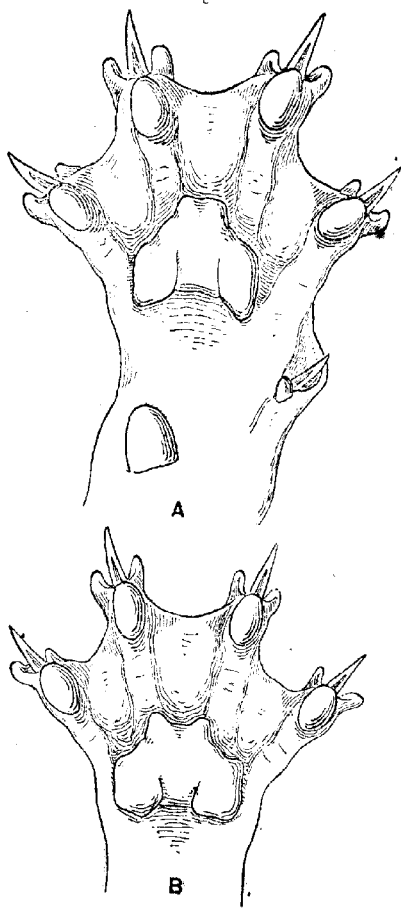
foot there is an inner lobe, but a very small one on the second, third, and fourth digits. The webs are developed to approximately the same extent as in *F. sylvestris* and *F. serval*. They do not conceal the tips of the claws, which



project to a certain extent, even beyond the hairs of the toes, especially on the hind feet, as shown by the sketches of the unclipped feet (fig. 8, A, B, C, D).

Felis nebulosa.—The feet are very short and broad with large pads. In the fore foot the carpal pad is very large

Fig. 9.



A. Right fore foot of *Felis nebulosa*. $\times \frac{1}{3}$.
 B. " hind foot of " " "

and rounded at the apex, the webs are deep and extend approximately up to the distal ends of the digital pads, and

on all the digits the claw-sheaths are perfected by the development of inner lobes. In the hind foot the plantar pad is very broad, the webs are very nearly as deep as in the fore foot, and all the digits, as in the fore foot, have well-developed inner lobes (fig. 9, A, B).

The feet of this species differ from those of *F. viverrina* in the larger size of the pads, the much deeper webs, and the much better developed claw-sheaths. In all these respects they more resemble the feet of *Panthera* described below.

The Feet of some American Species.

The feet of an American lynx, probably *F. rufus esquinapæ* (fig. 7, A, B), from Tampico, resemble those of *F. lynx isabellinus* in web-development, but the inner lobes of the sheaths of the claws are relatively smaller, both on the fore and hind feet, and the plantar pads are differently shaped, being markedly longer as compared with their width. Thus the median length of these plantar pads is about three-quarters their total width. They are less overgrown by hair than in *F. lynx isabellinus*, and recall in their shape and proportions the posterior plantar pad of *F. caracal*.

It may be recalled that Bangs has already pointed out (Proc. Biol. Soc. Wash. xi. pp. 48, 49, 1897) that the plantar pads of the lynxes (*F. rufus fasciatus*, etc.) of the more southern portions of North America are larger than those of the Canadian species (*F. canadensis*). Hence it may be inferred, I think, that the pads of *F. canadensis* probably resemble those of *F. lynx isabellinus*. The point, however, to be noticed here is that the three species of lynxes, namely, *F. caracal*, *F. lynx isabellinus*, and *F. rufus esquinapæ* have feet of the same general form, and that those of the Mexican animal are approximately intermediate in character between the feet of *F. caracal* and of *F. lynx isabellinus* *.

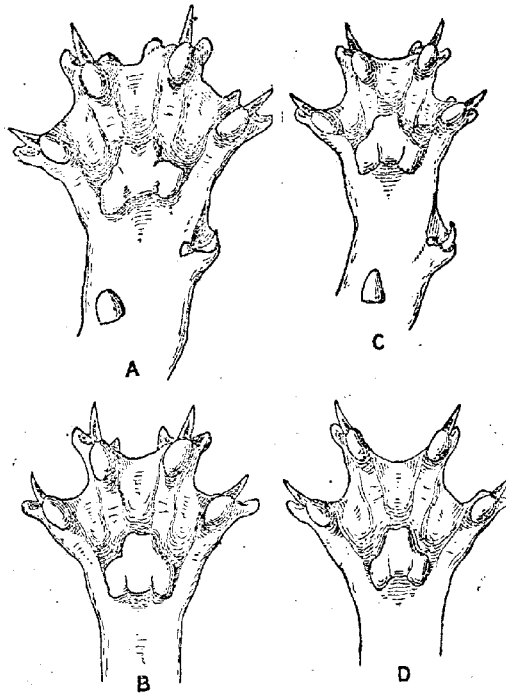
F. geoffroyi.—The feet are more robust than those of *F. sylvestris*, but are otherwise tolerably similar to them in the size of the pads and the development of the webs and of the claw-sheaths. The claw-sheaths are small. In the fore foot the inner lobe is negligible on the fourth and fifth digits, small upon the second and larger, but still small,

* The Tibetan lynx has been referred to the subgenus which at present carries the inadmissible name *Eucervaria*. That is a mistake, the skull characters being those of the typical forms, *F. lynx* and *F. canadensis*.

upon the third; and in the hind foot the inner lobes are negligible upon all the digits*.

F. jaguarondi.—In an adult example of the *F. eyra-* mutation from Cordova, in the Argentine, the fore foot is

Fig. 10.



- A. Right fore foot of *Felis wiedii*. $\times \frac{1}{2}$.
 B. " hind foot of " " "
 C. " fore foot of *Felis salinarum*. "
 D. " hind foot of " " "

shorter than in the example of *F. geoffroyi* examined, has the pads relatively larger, and the claw-sheaths better

* In all cats the edge of the skin upon the admedian or inner side of the claw is detached from the claw to a greater or less extent. Hence the rudiment of the inner portion of the sheath is always present, even in cases where it is stated to be negligible or absent in this paper.

developed, the inner lobes of the second and third digits being larger and a small one is present on the fourth. The webs, however, are developed to approximately the same extent. The hind feet of the two species are also approximately alike, except that in *F. jaguarondi* the claw-sheaths are a little larger and the third inner digit shows a small inner lobe. These differences, however, are less marked in a

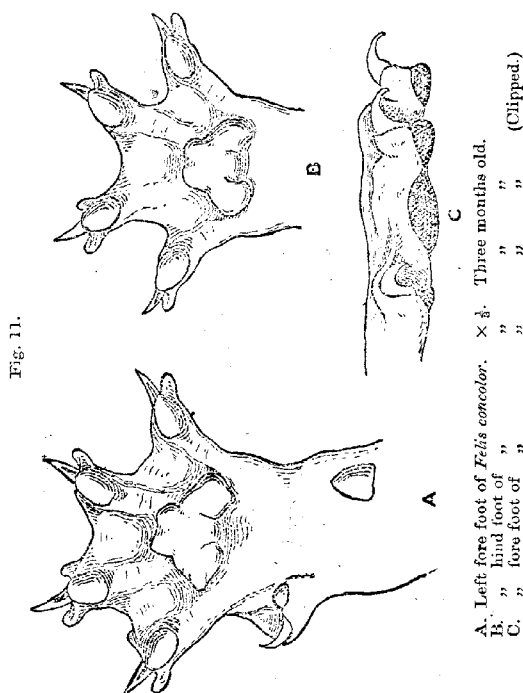


Fig. 11.

kitten of the same type from Cordova and in one of the dark-coloured forms of which the locality is unknown.

In *F. salinarum* (fig. 10, C, D) the feet closely resemble those of *F. geoffroyi* and *F. jaguarondi*.

F. wiedii (*macroura*). (fig. 10, A, B).—The feet are broad and short, with moderately well-developed pads. In the fore foot the webs are very deep and extend approximately

up to the distal ends of the digital pads, as in *F. nebulosa*. The claw-sheaths also are well developed, with distinct inner lobe upon the second, third, and fourth digits; but this lobe is sufficiently small to be negligible upon the fifth digit. In the hind foot the webs are also well developed, although shallower than on the fore foot. The inner lobe of the claw-sheath is negligible upon the second and fifth, but well developed on the third and distinct though small upon the fourth digit.

F. pardalis has feet similar to those of *F. wiedii* (Ann. & Mag. Nat. Hist. (6) xviii. p. 428, fig. 5, A, 1916).

It is interesting to notice that the feet of *F. wiedii* and *F. pardalis* differ rather markedly from those of *F. geoffroyi*, *F. salinarum*, and *F. jaguarondi*, and also from those of *F. concolor*, though to a slightly less extent, in the development of the webs and of the claw-sheaths.

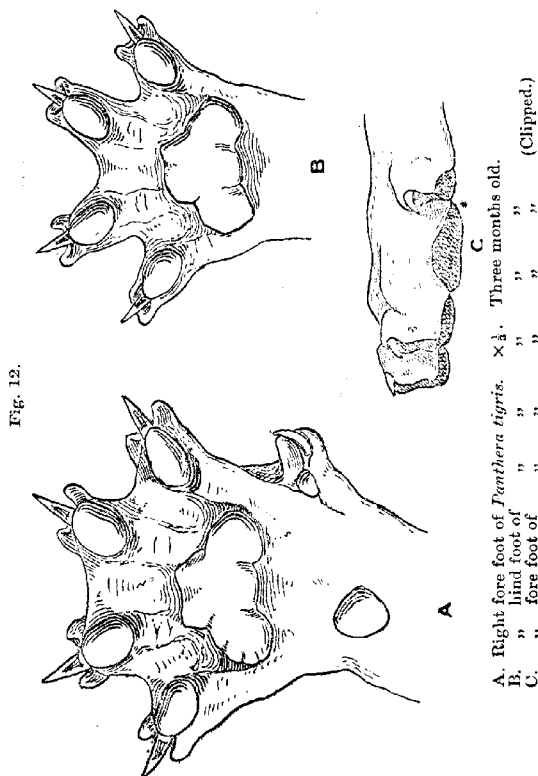
F. concolor (fig. 11, A, B, C).—In an example three months old the feet are shorter and broader than in *F. geoffroyi*, and provided with larger pads and better developed claw-sheaths. Nevertheless, the webs are developed to approximately the same extent, and the inner lobe of the claw-sheaths is small upon the second and third digits and negligible upon the fourth and fifth of the fore foot, and also negligible upon the second, fourth, and fifth of the hind foot. In neither foot do the sheaths encase the claws almost to the tip, and, in the extent to which the claws when retracted are exposed, the feet approximately resemble those of *F. geoffroyi*, *jaguarondi*, *viverrina*, and *sylvestris*, and do not conform to the type of foot of *Panthera* (fig. 12).

Genus PANTHERA, Oken.

In the species of the genus *Panthera* (fig. 12) examined, namely, *P. pardus*, *onca*, *tigris*, and *leo*, the feet are very much alike. They are short, broad, compact, and difficult to spread. The plantar and digital pads are large and the sheaths are well developed, both upon the outer and the inner side of the claw, and almost conceal the tips of the claws when retracted. In the fore foot the carpal pad usually has a widely rounded apex, and the webs extend almost up to the tips of the digital pads, at least on the admedian side, and show only a shallow emargination when the digits are stretched. In the hind foot the webs are less extensive and more emarginate.

Fig. 12 depicts the feet of a specimen of *P. tigris*, three months old. The feet of *P. pardus* I have already figured (Ann. & Mag. Nat. Hist. (8) xviii. p. 424, 1916).

Similar, however, as are the feet of this genus, they do not differ in important points from those of *F. nebulosa*, a



A. Right fore foot of *Panthera tigris*. $\times \frac{1}{2}$. Three months old.

| | | | |
|--------------|----|----|----|
| hind foot of | 31 | 33 | 35 |
| fore foot of | 31 | 33 | 35 |

(Clipped.)

species which has a more Pantherine skull than any species of *Felis* in the sense in which the latter term is used in this paper.

The facts above described show an interesting series of

gradations in the specialization of the feet of *Felis* in the following particulars:—

Claw-sheaths.—In their simplest form, as exemplified in *Felis sylvestris* or *F. geoffroyi*, these structures differ in no essential respects from those of some genera of Viverrinæ, like *Viverra* and *Genetta*.

In their most elaborate form, as exemplified in *Felis lynx*, *Panthera tigris*, and others, the inner lobes on all the digits are well developed and form claw-sheaths, complete externally and internally, but the extent to which they protect the tips of the retracted claws depends upon the degree of retraction of the claw-bearing phalanx by the elastic ligaments and upon the length of the sheaths themselves.

Between these two extremes every gradation in the development of the sheaths may be traced.

Webs.—The webs may, exceptionally, be very shallow, as in the hind feet of *F. caracal*, but in almost all cases they reach up to the proximal end of the digital pads, at least on their admedian side; but in other cases they extend beyond that point, and may, in the case of the front foot, reach practically to the distal end of those pads on the admedian side and exhibit only a slight emargination of the edge, as in *F. tigrina*, for example. In the hind feet the webs are always shorter than in the fore feet, but they exhibit a similar progressive series in development from species to species. In almost all cases well-developed webs are associated with well-developed claw-sheaths. A striking exception to this, however, is shown by the hind feet of *F. lynx*, where short and deeply emarginate webs accompany claw-sheaths, which are complete both externally and internally.

It is needless to compare the feet of the Felidæ with those of *Hyæna*, *Mungos*, *Galidia*, *Eupleres*, *Cryptoprocta*, *Nandinia*, *Paradoxurus*, and their allies. But a few genera of Eluroïds, formerly included in the heterogeneous family Viverridæ, approach the Felidæ tolerably closely in the structure of the feet, and, at all events, in the development of claw-sheaths, have more "feline" feet than has *Acinonyx*. There is scarcely any difference, for example, between *Genetta** and many species of *Felis* in the extent to which the claws are retracted and guarded by cutaneous sheaths. The same may be said of the feet of *Linsang* and *Poiana*†. But in the structure of the plantar and carpal pads, the low-set pollex, and the presence of the hallux,

* Proc. Zool. Soc. 1915, p. 136, fig. 3.

† Ann. & Mag. Nat. Hist. (8) xvi. pp. 342 & 345, pl. xii. (1915).

Genetta, *Poiana*, and *Linsang* have much more primitive feet. On the other hand, *Viverricula* has a single cordate carpal pad, a simple trilobed plantar pad, and a small pollex set almost as high as in many Felidæ. The hind foot, however, retains a small hallux; and it seems that the invariable presence of this digit is the only character that can be definitely affirmed as distinctive of the feet of the Viverrinæ (*Viverra*, *Viverricula*, *Civettictis*, and *Genetta**) when compared with those of the Felidæ*.

The Anus and External Genitalia.

The anus and the external genitalia, both in the male and the female, of the Felidæ present very little variation in structure. The anus itself opens in the centre of a circular area of naked skin, and in the female the skin immediately surrounding the vulva is naked or sparsely hairy; the perineal region between the two is short, hairy, and unmodified, and the clitoris is minute. In the male the perineal region is also hairy and unmodified, and the prepuce is situated close to the scrotum. The glans penis is short, subconical, usually armed with backwardly directed spiny papillæ, is boneless, or, at most, fortified with a small bone, and the urethra opens close to the tip.

In its short unmodified perineum, the shortness of the glans penis, and the closeness of the prepuce to the scrotum the ano-genital area of Felidæ resembles that of *Nandinia* and the Mungotidæ, and, so far as I am aware, of *Eupleres* and *Linsang*. My acquaintance with the area in *Eupleres* and *Linsang* is, however, restricted to the female, and I do not know whether the prepuce is close to the scrotum or not. *Fossa* is another genus about which very little seems to be actually known with respect to this region, except that the perineum is unmodified and that the prepuce, judging from dried skins, is situated far in front of the scrotum, a character which must be regarded as primitive in the Carnivora.

So far as this area is concerned, the Felidæ may be distinguished from *Nandinia* by the absence of the large scent-gland situated in front of the prepuce and vulva in that genus, from the Mungotidæ by the absence of the circum-anal glandular sac and the situation of the small urethral orifice at the tip of the glans penis instead of beneath it.

Of the remaining genera of Æluroids, the Viverridæ

* Very exceptionally the hallux is present in the Felidæ. I have seen it in a lioness.

(*Viverra*, *Paradoxurus*, *Cynogale*, and their allies) have the perineal area provided with scent-glands, situated in the male between the scrotum and the prepuce, which are widely separated. In *Galidictis* and *Galidia* a similar gland is present at least in the female, the position of the prepuce being unknown. In the Hyænas there is a large sac, receiving the secretion of the anal glands, above the anus, the prepuce is far in advance of the scrotum, and the glans penis is long.

Finally, *Cryptoprocta*, which has even been referred to the same family as the Felidæ on account of the misleading character of its dentition, has widely different external genitalia and the anus opening into a large sac.

Thus, if we set aside *Linsang*, *Eupleres*, and *Fossa*, about which our knowledge is defective, it may be seen that the genito-anal area of the Felidæ possesses a combination of characters distinctive of this family of Æluroidea.

VIII.—On some new Mites of the Suborder Prostigmata living on Lizards. By STANLEY HIRST.

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THE Acari described below are forms living on lizards, and, with the probable exception of *Pimeliaphilus tenuipes*, they are all true blood-sucking parasites.* The species dealt with in this preliminary note will be figured and described in detail in a later paper on parasitic mites.

Genus PTERYGOSOMA, Peters.

Pterygosoma persicus, sp. n.

♀.—*Body* much wider than long. On each side of the anterior end of the *dorsum* there are two patches of very short plumose hairs; these patches being almost continuous with one another, the inner one consists of about 5–8 hairs, the outer of 8–16 hairs. Hairs on rest of *dorsum* very few in number; some distance behind the anterior patches of hairs there is a transverse row of four plain hairs, which are short and widely separated from one another; there are also two or three rather long fine hairs on each side near the margin; posteriorly there are two more pairs of short plain

hairs (one pair placed behind the other); finally, two pairs of short plumose hairs situated near the posterior margin, those of the inner pair being placed on either side of the genital aperture. On each side of the posterior margin there is a fringe of about nineteen or twenty very long hairs, which are quite fine, not being feathered or modified in any way. *Venter* with only four pairs of fine plain hairs, which are of moderate length. There is also a tuft of eleven very long fine hairs on each side of the genital aperture. *Legs* slender and of moderate length; coxæ unarmed, being furnished with long fine hairs.

Length of body .6 mm.; its width 1.15 mm.

Hab. Sixty miles north-west of Kermanshaw, Persia; a few specimens found under the scales of the tail of *Agama nupta*.

Pterygosoma melanus, sp. n.

♀.—This species is not so wide as compared with its length as is usually the case in the genus. On each side of the anterior end of the *dorsum* there is a band of short slender plumose hairs. Hairs on the rest of the *dorsum* very few in number and widely separated from one another; some distance behind the anterior margin there are two pairs of racket-shaped hairs arranged so as to practically form a transverse row, and a little further back there is another pair of similar hairs. Posterior margin furnished with a fringe of about 18–22 hairs, which are rather short and paddle-shaped, the basal portion being short and cylindrical, but the rest of the hair flattened so as to form a rather wide blade-like expansion, which is striated. Hairs on *venter* very few in number, a pair of short plain hairs being situated immediately behind the mouth-parts, and another pair of similar hairs in the middle of the body; posteriorly there are two more pairs of hairs, which have the distal end plumose. *Legs* slender and rather short; coxæ unarmed, being furnished with quite fine plain hairs.

Colour (spirit-specimens) usually black, but sometimes paler.

Length of body .72 mm.; its width 1.1 mm.

Hab. Deelfontein, Cape Colony; several specimens found under axillæ and ventral folds of neck of *Agama atra*. Klipfontein, Damaraland; two specimens found on the same host.

Pterygosoma neumanni, Berl.

Hab. Specimens from *Agama colonorum*, Gooli Mountains, Somaliland.

It is probable that this mite is only a variety of *P. agamæ*, Peters.

GECKOBIELLA, gen. nov.

Body long-oval, being much longer than wide, instead of wider than long as is the case in the genus *Pterygosoma*. *Scutum* absent. Numerous short plumose hairs are present on the *dorsum* and sides. *Venter* only furnished with very few hairs. Free portion of *peritreme* rather long and directed forwards. *Coxæ* not nearly so much fused together as is the case of *Geckobia* and *Pterygosoma*, and only furnished with fine hairs.

This new genus is founded for *Geckobia texana*, Banks; as will be seen from the details given above, it is more closely allied to *Pterygosoma* than to *Geckobia*, but differs from the former in the shape of the body, which is longer than wide, instead of the reverse, and in the structure of the *coxæ*, which are only slightly fused with one another.

Geckobiella texana, Banks.

Hab. Duval County, Texas; two adult specimens and numerous larvæ found on *Sceloporus spinosus*, var. *clarkii* (= *S. floridanus*).

Genus GECKOBIA, Mègnin.

Geckobia latasti, Mègn.

Hab. We have specimens of this mite from Castelfusano, Ostia, and also from Lisbon and Seville. These examples were taken from between the toes of *Tarentola mauritanica*.

Geckobia clelandi, sp. n.

♀.—*Body* about as wide as long. Dorsal *scutum* well developed and much wider than long; it reaches its greatest width just before the posterior margin, being angular and salient at this point. The *scutum* is furnished with ten hairs, arranged in two transverse rows, an anterior row composed of four hairs (two being placed close together on each side) and a posterior row of six (three on each side of the *scutum*); these hairs are similar in structure to those on the rest of the dorsal surface, and are fairly

long. A short distance in front of the outermost hair of the hinder row there is a minute rounded structure, which possibly is an obsolete eye. Hairs on rest of dorsal surface fairly numerous, but not placed close together; they are mostly of moderate length and are club-shaped, the distal end being enlarged and plumose. Hairs on venter numerous, but not placed close together; most of them are much smaller than those on the dorsal surface, and have the distal end plumose but not distinctly enlarged; hairs at the sides and hinder end large and club-shaped, however. On each side of the vulva the integument forms a large conical process. Plumose hair on second segment of *palp*, slender, curved, and not very long. *Legs*. Hinder legs not swollen, but they are longer than the front ones. First coxa furnished with two long fine hairs, which are not plumose. Coxæ 2-4 each with two short hairs, which are plumose distally (sometimes there are three on the last coxa). There is a conspicuous, club-shaped hair on the dorsal surface of the femora of the legs, and a similar but much smaller hair is present on the anterior surface of the first femur.

Length of body .64 mm.; its width .61 mm.

Colour red when alive (in spirit yellowish).

Hab. Sydney (ii. 16) and Narabeen, New South Wales (14. xi. 15); specimens from *Gymnodactylus platurus* forming part of Dr. J. Burton Cleland's collection.

Geckobia indica, sp. n.

♀.—*Body* much wider than long. *Scutum* transversely elongated, being very much wider than long; its posterior margin is divided into two rounded lobes by a distinct indentation in the middle. A minute eye is present on each side near the anterior margin. There are about 34-46 plumose hairs on the scutum, all of them being quite short, especially the posterior ones. Similar hairs are present in the middle of the *dorsum*. Hairs at sides and posterior end of moderate length, slender and blunt; apparently they are not plumose. Hairs of posterior tufts of moderate length. Anterior hairs on *venter* very short and indistinctly plumose. Hairs on rest of lower surface long, slender and pointed. Hairs on second segment of the *palp* quite slender and plumose. *Legs*. Posterior legs longer than the anterior ones, but not much stouter. Spurs on coxæ well developed, being large and stout; there is also a plumose seta on the trochanter and femur

of the fourth leg, but these setæ are much more slender than the coxal spurs.

Length of body .24 mm.; its width .375 mm.

Hab. Several specimens found under ventral scales of a gecko (*Hemidactylus gleadowi*) from Upper Sind.

Geckobia papuana, sp. n.

♀.—*Body* much wider than long. *Dorsum* furnished with numerous hairs. At the anterior end there are two groups, each consisting of six stout plumose hairs, which are not very long. Behind them there are numerous very short, pointed, plumose hairs. Hairs at sides and hinder end of body of moderate length, slender, and not distinctly plumose. Hairs of posterior tuft long. Eyes present, but very minute and inconspicuous. Hairs on venter numerous. Anteriorly there is a number of very short plumose hairs or spinules. The rest of the lower surface is densely furnished with hairs, which are shaped rather like long narrow spear-heads, being flattened dorso-ventrally and having the point long and narrow. Last pair of *legs* greatly swollen, the anterior pairs comparatively slender. Coxæ armed with stout spurs, which are curved and plumose; two spurs are present on the second coxa, two on the third, and three on the fourth. There is also a spur on the trochanter and femur of the fourth leg, that on the femur being placed on a large protuberance.

Length of body .34 mm.; its width .5 mm.

Hab. Specimens found under ventral scales of a gecko (*Gymnodactylus louisianensis*) from German New Guinea.

Geckobia malayana, sp. n.

♀.—Closely allied to *G. papuana*, sp. n. *Body* much wider than long. *Dorsum* furnished with numerous hairs. Two groups, each consisting of five rather stout plumose hairs, which are not long, are situated at the anterior end of the body, and they are followed posteriorly at a short interval by a pair of similar hairs. Numerous very short plumose hairs, which are pointed, are present in the middle area of the dorsal surface. Hairs at sides and posterior end long, slender, and apparently not plumose. There is a minute but distinct eye on the outer side of the group of stout plumose hairs. Hairs of the posterior tuft very long and slender. *Venter* with numerous hairs. Immediately behind the coxæ there is a band of very short

pointed hairs or spinules; hairs on the remainder of the ventral surface long and very slender. *Legs* of fourth pair much larger and stouter than the others. There is the usual number of spurs on the legs; the one on the femur of the last leg is not situated on a protuberance.

Length of body .28 mm.; its width .49 mm.

Hab. Several specimens found on geckoes (*Gymnodactylus pulchellus*) from the Jalor Caves, Malay Peninsula.

Geckobia boulengeri, sp. n.

♀.—*Body* longer than wide and attaining its greatest width some distance behind the middle. *Scutum* distinct and almost triangular (wedge-shaped); the anterior margin is slightly concave and strongly salient laterally. Ten plumose hairs are present on the scutum, all of them being very short and stout; six of these hairs are situated close behind the anterior margin (almost forming a transverse line), three being placed on each side. Posteriorly there are two lateral hairs on each side, one being situated immediately behind the other on the margin of the scutum. A minute eye is present on each side on the salient portion of the anterior margin. Numerous short plumose hairs are present on the rest of the *dorsal surface*, the anterior ones being usually rather stout, blunt, and very short; the others are more elongated, however. Hairs at the sides and hinder end of the body slender, fairly long, and blunt; apparently most of them are not feathered. Hairs of the posterior tuft long. *Venter* with very numerous contiguous hairs, the anterior ones being short and plumose, the others of moderate length, fine, and not feathered. *Legs*. Anterior legs slender, those of the third pair considerably longer and stouter; whilst the fourth pair are also long and are greatly swollen. Short stout spurs similar to those present in *G. papuana* etc. are present on the proximal segments of the legs.

Length of body .47 mm.; its width .43 mm.

Hab. A number of examples found on a gecko (*Gehyra yunnanensis*) from Yunnan Fu, China.

Geckobia socotrensis, sp. n.

♀.—*Body* wider than long. *Scutum* absent. Anteriorly the *dorsum* is furnished with numerous very short plumose hairs, which are slender, pointed, and subequal in length, none of the anterior ones being enlarged. Hairs at sides and posterior end of body only of moderate length and

often sinuous; apparently they are not plumose. Hairs on *venter* flattened and scale-like as in *G. loricata*, Berl., but much narrower and more elongated (spindle-shaped), and sharply pointed posteriorly. Distal hair on second segment of *palp* short, fairly stout, and plumose. *Legs*. Coxæ furnished with the usual spurs, but they are blunt and not nearly so strong as in *G. loricata*; trochanters also with a short but rather stout seta. All the legs are of approximately the same thickness, the posterior ones being the longest.

Length of body .3 mm.; its width .37 mm.

Hab. A few specimens found under axillæ of a gecko (*Pristurus rupestris*) from Jena-Agahan, Socuotra.

Geckobia loricata, Berl.

Hab. I have examined specimens of this species found under the ventral scales of specimens of *Tarentola mauritanica* from Lisbon and also from the Riviera.

Geckobia australis, sp. n.

♀.—*Body* wider than long. *Scutum* absent. Hairs on the anterior two-thirds of the *dorsum* much more uniform both in size and distribution than in *G. loricata*, Berl., none of the front ones being enlarged, all being very short. Posterior hairs on *dorsum* of moderate length and sometimes plumose, but the feathering is rather difficult to see. Ventral hairs flattened and scale-like, most of them being spindle-shaped and pointed posteriorly; the posterior ones are more elongated, however. The hair on the dorsal surface of the *palp* is stout and plumose. Posterior *legs* longer and stouter than the anterior pairs, those of the fourth pair being considerably swollen. Coxal spurs large and curved; there is also a plumose seta on the posterior trochanters and on the femur of the fourth leg.

Length of body .36 mm.; its width .425 mm.

Hab. Several specimens found under ventral scales of a gecko (*Lygodactylus capensis*), from Beira, Portuguese East Africa.

Genus PIMELIAPHILUS, Trägårdh.

Pimeliaphilus tenuipes, sp. n.

♀.—*Body* oval, being much longer than wide. *Scutum* triangular, the anterior margin almost straight, being very slightly concave in the middle; the posterior end bluntly

pointed; the scutum is furnished with six plumose hairs, a transverse row of four hairs being situated on the anterior margin; the other two a little behind the middle of its length; these hairs are quite long, being slightly longer than the scutum. Arrangement of hairs on dorsum the same as in *P. podapolipophagus*, Trägårdh, and *P. insignis*, Berl. First of all, there is an outer hair on each side situated on the same platelet as the eye, the latter being placed in front of the hair. There are also four longitudinal rows of slender plumose hairs, the outer rows each consisting of two long hairs and a shorter posterior hair, the inner rows each of three long hairs. On each side of the genital opening there are two hairs of moderate length and also an inner border of three short hairs. All these hairs on the dorsal surface are slender and plumose, and their sockets are not enlarged. Hairs on *venter* few in number; there is a pair of short fine hairs between the last coxæ, followed posteriorly by three pairs of plumose hairs. Integument marked with a sculpturing of very fine wavy lines as in *P. podapolipophagus*. Projecting portion of *peritreme* short. *Chelicera* shaped very like that of the species of *Geckobia*, the basal part being short, compact, well defined, and strongly convex dorsally; the rest of the chelicera forming a long slender style, which, apparently, is not bifid at the end as in the two known species of *Pimeliaphilus*, but ends in a single minute tooth or claw, which is slightly curved. *Palp* short: the basal segment is salient laterally and has a sharp prominent transverse ridge on its dorsal surface; second segment dorsally with a long slender plumose hair; the next two segments each with a shorter hair, which is very fine and apparently not plumose. *Legs* long and slender, and furnished with numerous fine plumose hairs. With the exception of the last, each of the coxæ has a pair of short hairs, the inner hair being fine and not plumose, the outer stouter and apparently plumose. There is also a forwardly directed plumose hair on the anterior surface of the third coxa.

Length of body .274 mm.; its width .22 mm.

Colour (in spirit). Body red, but whitish anteriorly and marked with a pale central line both above and below. appendages pale.

Hab. A single example found on a gecko (*Gonatodes albogularis*), from Honda, Magdalena River, Colombia.

IX.—Cassidinæ and Bruchidæ [Coleoptera] from the Seychelles Islands and Aldabra. By S. MAULIK, B.A. (Cantab.).

THIS paper deals with the material of these groups obtained by the Percy Sladen Trust Expedition, in 1908-9, in the Seychelles Islands and Aldabra. Many of the results of this expedition have been published in special volumes of the Linnean Society's 'Transactions' (ser. 2, Zool. vols. xii.-xvii.), in which series the writer of the present paper has already reported on the Hispiinæ of the Seychelles (vol. xvi. pp. 237-242, 1913).

Chrysomelidæ.

* CASSIDINÆ.

This subfamily is represented by two species—*Hoplionota lila*, sp. n., and *Aspidomorpha apicalis*, Klug. The former is allied to certain Madagascar species, the latter is known from Madagascar and Africa. The only member of the group previously recorded from the Seychelles was *Coptocycla leopardina*, Boheman, known also from Madagascar and the Comoro Islands; but this was not obtained by the Percy Sladen Trust Expedition. *

HOPLIONOTA, Hope.

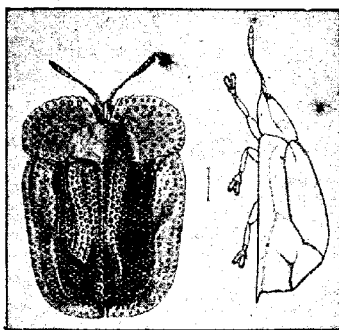
1. *Hoplionota lila**, sp. n.

Quadrate, slightly narrowed behind; as seen in profile very convex behind the middle, from the highest point of the convexity a gentle slope towards the head and a sudden decline towards the posterior extremity; subnitid. Head, antennæ, prothorax with its lateral expansions, scutellum, the elytral expansions, and the underside orange-red. Eyes black. Basal half of elytra green, without costæ, apical half dark red. Elytra without spines or tubercles. Length 5 mm.; greatest breadth 4.5 mm.

Head not completely concealed under the pronotum, dorsal surface slightly depressed between the eyes; viewed dorsally the vertex is bilobed and slightly projecting; the antennæ are situated under the lobes. Eyes oblong-ovate. Antennæ: joint 1 elongate and distally thickened, joint 2

* A Sanskrit word, used with reference to the green colour of the elytra.

small and rounded, joints 3-6 elongate and more slender, joints 7-11 form a dilated club which is covered with brownish pubescence. *Pronotum* twice as broad as long, front margin more or less serrated, lateral margins rounded; surface of disc uneven, impunctate; the lateral expansions with large and deep punctures, the centres of which are more or less hyaline. *Scutellum* triangular; apex rounded. *Elytra*: basal portion green, deeply and closely punctate, centres of punctures red; the green portion of each elytron is separated from the apical red portion by an oblique costa, one end of which terminates in a swelling at the middle of the lateral expansion, the other end joining with an irregularly-branched costa on the apical red portion of the elytron; costæ shining; the apical red portion of the elytra



Hoplionota lila, sp. n.

has the suture raised and is deeply and closely punctate; elytral expansions sparsely and deeply punctate, centres of the punctures more or less hyaline.

Loc. Seychelles: Mahé; Cascade Estate, ca. 800 ft., 1909 (H. P. Thomasset).

Type in the British Museum: described from one example.

H. lila is related to *H. thieni*, Weise, *H. guerini*, Weise, and *H. marginata*, Boh., from Madagascar. All of these are without elytral spines or tubercles, and also have the basal portion of the elytra without any pronounced costa. *H. lila* differs from all the others by (1) the orange-red colour of the prothorax, scutellum, &c., (2) its larger size, (3) the proportionately greater length of the antennæ, (4) the

greater sloping of the elytra from the highest convex point, (5) the more pronounced character of the costæ on the apical portion of the elytra.

ASPIDOMORPHA, Hope.

2. *Aspidomorpha apicalis* (Klug).

Cassida apicalis, Klug, Ins. Madag. 1833, p. 122; Boheman, Mon. Cassid. ii. 1851, p. 257.

Cassida decolorata, Boheman, Cat. Brit. Mus. ix. 1856, p. 144; id. Mon. Cassid. iv. 1862, p. 347.

Cassida subevanæa, Thomson; Weise, Deutsche Ent. Zeitschr. 1896, p. 19; Kolbe, Abh. Senckenb. Naturf. Ges. xxvi. 1902, p. 584.

Var. *lutea*, Fairm., Bull. Soc. Ent. France, 1896, p. 223; Weise, in Voeltzkow, Reise in Ost-Afrika, ii. 1910, p. 504.

Loc. Seychelles: Mahé; Cascade Estate, ca. 1000 ft., i.-ii. 1909. Aldabra (*teste* Fairmaire and Kolbe). Known also from Madagascar and widely spread in Africa.

The specimens from Mahé are all from cultivated land. Several were found, together with a larva and a pupa, on the leaves of sweet potatoes (*Ipomæa batatas*) in Jan. 1909. After death most dried examples fade from green to a uniform light yellow.

COPTOCYCLA, Chevrolat.

3. *Coptocycla leopardina*, Boheman.

Coptocycla leopardina, Boheman, Mon. Cassid. iii. 1855, p. 255; id.

Cat. Brit. Mus. 1856, p. 175; Fairmaire, Ann. Soc. Ent. Belg. xxxvii. 1893, p. 525; Alluand, Cat. Col. Région Malgache, 1900, p. 333.

Not obtained by the Percy Sladen Trust Expedition.

Loc. Seychelles (*teste* Fairmaire, l. c.). Madagascar, Comoros.

Bruchidæ.

Apparently no member of this family has been recorded hitherto from any of the islands under review. Two species were collected by the Expedition—one in Seychelles, the other in Aldabra. According to Pic's 'Catalogue of Bruchidæ' (1913), both are Oriental.

PACHYMERUS, Thunberg.

Caryoborus, Schönherr.

4. *Pachymerus gonager* (Fabr.).

Loc. Seychelles: Mahé, two specimens from Port Victoria, xii. 1908. East Indies (Pic, Catalogue, p. 7). The

British Museum contains specimens from Bombay, South India, Ceylon, and Java. Lefroy ('Indian Insect-Life,' p. 351) states that this insect is common in India, the larva living in the seeds, and the adult eating the leaves, of the tamarind: he refers also to the description of the life-history by Elditt (1860), who reared the beetle from pods of *Cassia*.

SPERMOPHAGUS, Schönherr.

5. *Spermophagus convolvuli* (Thunberg).

Loc. Aldabra, xi. 1908 (Fryer), sixteen specimens, seven of which are stated to have been bred from fruits of *Evolvulus alsinoides*, Linn. Pic's Catalogue (p. 59) records the species from Ceylon, South Russia (introduced), and doubtfully from South Africa.*

X. — *Notes on Fossorial Hymenoptera*. — XXVI. *On the Genus Homonotus*, Dahlb. By ROWLAND E. TURNER, F.Z.S., F.E.S.

Family Psammocharidæ.

Genus HOMONOTUS, Dahlb.

Homonotus, Dahlb. Hymen. Europ. i. p. 35 (1843) (nec p. 441, 1845).
Wesmaelinus, Costa, Prosp. Imen. Ital. ii. p. 46 (1887).
Hemisalius, Saussure, Grandidier, Hist. Madagascar, xx. p. 313 (1892).

This genus is poor in species, but has a wide range in the Old World, though apparently absent from America. It may be distinguished by the convex head, strongly hollowed behind; the clypeus prolonged and covering the mandibles; the long and somewhat flattened median segment, emarginate at the apex and with the apical angles produced into stout spine-like processes; by the bifid tarsal unguis; and by the cubitus of the hind wing originating beyond the transverse median nervure. Second and third joints of the flagellum subequal, short. The neurulation of the fore wing in the genus is variable, both in the proportion of the second and third cubital cells and in the length of the submedian cell, but the first recurrent nervure is received before the middle of the second cubital cell. As in many genera of the family there is a group of identical structure with only two cubital cells, the second transverse cubital nervure being absent. The species I have not seen are marked*.

Homonotus sanguinolentus, Fabr.

Sphex sanguinolenta, Fabr. Entom. Syst. ii. p. 211 (1793).
Salix dorsalis, Sm. Ann. & Mag. Nat. Hist. (4) xii. p. 265 (1873). ♀.

This is the type of the genus and occurs throughout Europe, also ranging as far as Eastern Siberia. Though the thorax and median segment are usually red in the female, much variation exists in this respect, the female sometimes having the thorax and median segment wholly black.

Homonotus ariadne, Cam.

Pompilus (Ferreola) ariadne, Cam. Mem. Manchester Lit. & Phil. Soc. (4) iv. p. 462 (1891).

Hab. N.E. India; S. India; Ceylon; Tenasserim.

Homonotus albistylus, Sauss.

Hemistylus albistylus, Saussure, Grandidier, Hist. Madagascar, xx. p. 315 (1892). ♀.

Hab. Madagascar.

Evidently very closely allied to *ariadne*, having the same nervure at the base of the first cubital cell.

Homonotus exulans, Turn.

Pedinaspis exulans, Turn. Proc. Zool. Soc. London, p. 338 (1910). ♀.

I doubt if this is more than a geographical race of the Indian *Homonotus ariadne*, Cam., but the spines at the apical angles of the median segment are distinctly longer and more acute in Australian specimens.

Hab. Mackay and Kuranda, Queensland; February to June.

Homonotus nudiventris, Turn.

Pedinaspis nudiventris, Turn. Proc. Zool. Soc. London, p. 339 (1910). ♀.

This differs from *exulans* in the colour of the wings and nervures, and in the much shorter and blunter spines at the apical angles of the median segment.

Both species and also *H. ariadne*, Cam., have the submedian cell of the fore wing as long as the median, not a little shorter as in the European *H. sanguinolentus*, Fabr. The first cubital cell is also pointed at the base, projecting towards the base of the wing a little beyond the basal nervure, in this also differing from *sanguinolentus*.

Hab. Mackay, Queensland; October.

This may prove to be a seasonal form of *exulans*.

Homonotus ægyptiacus, Rad.

Wesmaelinus ægyptiacus, Rad. Bull. Soc. Natural. Moscou, p. 473. (1898). ♂.

A male in the British Museum from Uganda answers well to the description, but has the greater part of the femora, as well as the tibiæ and tarsi, ferruginous; the apex of the abdomen is red from the middle of the third segment. With this I associate a female from North Rhodesia in which the legs are black, the calcaria whitish, and the abdomen red from the base of the third segment. The submedian cell in this species is slightly longer than the median.

Hab. Mt. Kokanjero, S.W. of Elgon, 6000 ft., Uganda (S. A. Neave), August; 70 miles west of Kariba Gorge, N. Rhodesia (*Silverlock*), June.

I assume that this is the species described by Radoszkowski, being the only species of the genus with similar colouring known to me. I have, however, seen a species more nearly allied to *Planiceps* in which the three apical segments of the abdomen are red in the female; but this has a short clypeus and the tarsal ungues are bidentate near the base, and I do not think it can have been mistaken for a *Homonotus*. It was taken at Harar.

Homonotus nursei, sp. n.

♀. Nigra; mandibulis fusco-ferrugineis; antennis fuscis, subtus fusco-testaceis; clypeo apice, tegulisque testaceis; pedibus fuscis; tarsis pallide ferrugineis, articulo basali basi, calcaribusque albidis; alis hyalinis, venis basi testaceis, apice fuscis.

Long. 4-6 mm.

♀. Clypeus produced over the mandibles, very broadly rounded at the apex; second and third joints of the flagellum subequal. Front strongly convex, temples very narrow, the eyes nearly reaching the hind margin of the head. Posterior ocelli very far apart, about four times as far from each other as from the eyes. Pronotum scarcely longer than the mesonotum, much broader than long, narrowed anteriorly. Median segment emarginate posteriorly, the apical angles produced into stout and rather blunt spines. First and second abdominal segments about equal in length, the basal half of the second dorsal segment rather thinly covered with very short grey pubescence. The longest calcar of the hind and intermediate tibiæ a little longer than the basal joint of the tarsi. First cubital cell narrowly rounded at the base; submedian cell a little shorter than the median; third abscissa of the radius longer than the second; first recurrent nervure

received at about one-third from the base of the second cubital cell, second just before the middle of the third cubital cell. Cubitus of the hind wing originating beyond the transverse median nervure.

Hab. Deesa, W. India (*Nurse*); April.

This is a smaller species than *albocalcaratus*, Rad., and has the third cubital cell longer than the second, not shorter as in that species; the colour of the antennæ and tarsi is also different.

Homonotus albocalcaratus, Rad.

Wesmaelinus albocalcaratus, Rad. Bull. Soc. Natural. Moscou, p. 472 (1888). ♀ ♂.

A single male in the British Museum from Karachi (*Comber*) corresponds fairly well with the description, but the wings are hyaline, not infusate, and the clypeus is broadly rounded at the apex, not subemarginate; but I am inclined to look on the latter as a sexual difference.

Hab. Orenburg; Caucasus; Siberia.

**Homonotus caucasicus*, Rad.

Wesmaelinus caucasicus, Rad. Bull. Soc. Natural. Moscou, p. 472 (1888). ♀.

Hab. Caucasus.

Homonotus transcaspicus, Rad.

Wesmaelinus transcaspicus, Rad. Horæ Soc. Ent. Ross. xxvii. p. 60 (1893). ♀.

Hab. Merv.

**Homonotus steini*, Schulz.

Homonotus affinis, Stein, Berlin. ent. Zeit. iii. p. 68 (1869) (nec *Pompilus affinis*, Ev. = *H. sanguinolentus*, Fab.).

Pompilus steini, Schulz, Spolia Hymen. p. 168 (1906).

Hab. S.E. Hungary.

Doubtfully distinct from *sanguinolentus*.

**Homonotus costæ*, Tourn.

Wesmaelinus costæ, Tourn. Entom. Genév. i. p. 156 (1889). ♀ ♂.

Pompilus wettsteini, D. T., Cat. Hym. viii. p. 336 (1897).

Hab. Sicily.

Subgenus GILBERTELLA, nov.

Differs from *Homonotus* in having only two cubital cells, the second transverse cubital nervure being absent.

Type of the subgenus, *Planiceps umbraticus*, Turn.

Homonotus (Gilbertella) umbraticus, Turn.

Planiceps umbraticus, Turn. Proc. Zool. Soc. London, p. 337 (1910). ♀.

The second cubital cell is very long, receiving the recurrent nervures near the base and near the apex. As in other Australian species of *Homonotus*, the base of the first cubital cell emits the stump of a nervure into the median cell. The submedian cell is a little shorter than the median. Calcaria of the intermediate and hind tibiae very long, slightly exceeding in length the basal joint of the tarsi.

Hab. Mackay, Queensland; January and February.

Homonotus (Gilbertella) disparilis, sp. n.

♂. Niger; antennis subtus, tibiis anticis intermediisque subtus, tarsisque fusco-ferrugineis; calcaribus albidis; alis fusco-hyalinis, venis nigris.

Long. 5 mm.

♂. Clypeus very broadly rounded at the apex, covering the mandibles; second and third joints of the flagellum subequal; front shining, moderately convex. Posterior ocelli about twice as far from each other as from the eyes; temples very narrow. Pronotum narrowed anteriorly, scarcely as long as the mesonotum; median segment a little longer than broad, emarginate at the apex, the apical angles produced into long stout spines. Second abdominal segment a little longer than the first; the two apical ventral segments strongly compressed laterally. The longest calcar of the hind and intermediate tibiae not quite as long as the basal joint of the tarsus; hind tibiae moderately spinose; tarsal unguis rather feebly bifid near the apex. Two cubital cells; the second abscissa of the radius twice as long as the first; the recurrent nervures received at one-quarter from the base and at one-quarter from the apex of the second cubital cell; second transverse cubital nervure received just before the middle of the radius. Submedian cell distinctly longer than the median; cubitus of the hind wing originating far beyond the transverse cubital nervure.

Hab. Mlanje, Nyasaland (S. A. Neave); May.

The second cubital cell is much shorter than in *umbraticus* and the recurrent nervures are received much nearer together. In *umbraticus* the second transverse cubital nervure is received just before two-thirds from the base of the radius. The spines at the apical angles of the median segment are longer in this species than in any other known to me.

XI.—Notes on the Species of the Genus *Cavia*.

By OLDFIELD THOMAS.

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THE genus *Cavia* ranges from Venezuela and Guiana in the north of South America to the pampas of Buenos Ayres in the south, and extends across the whole breadth of the continent, from Peru to Pernambuco.

Any examination of the species that exist in this area, and their correct names, has been rendered very difficult by the occurrence of such widely different specimens in the same areas, on which account I have long hesitated to attempt to work out this puzzling group. Definite cranial characters seemed almost non-existent, and one appeared to be reduced to distinguishing the local forms purely by average differences of size and shades of colour in a group where there is not a great range in either.

On taking up the subject afresh, however, I find that one character, observed by Lund in 1838, but overlooked ever since, definitely and sharply separates the smaller Brazilian species from the larger; and then, these smaller forms being laid on one side, the whole problem immediately becomes simplified.

This character is the possession by *Cavia fulgida*, the smaller Brazilian cavy, of a deep outer re-entrant angle or notch at the front end of the posterior lobe of m^3 *, this angle being quite shallow in the larger forms. This notch is so deep and well defined that there is practically never any case where one is doubtful as to the allocation of an individual skull.

When writing about the group in 1901 †, I recognized *Cavia fulgida* (under the name of *rufescens*) by its smaller size, but, not knowing of the tooth-character, I erroneously made the small Argentine "quiso" a subspecies of it. Now, however, it is evident that there is no special relationship between the two.

Taking first the ordinary species without the extra molar notch, and going from north to south on the Eastern non-Andean part of the continent, we have in Guiana

* Figured by Lund, K. Dansk. Vid. Selsk. viii. pl. xxv. fig. 15.

† Ann. & Mag. Nat. Hist. (7) viii. pp. 532-534 (1901).

Cavia guianæ, Thos.

C. porcellus guianæ, Thos. Ann. & Mag. Nat. Hist. (7) viii. p. 152 (1901);

and in Venezuela

"*Cavia porcellus venezuelæ*," All. Bull. Am. Mus. xxx. p. 250 (1911), whose distinction from *guianæ* appears most doubtful.

As regards *guianæ*, the original statements about its characters were largely influenced by the fact that at that date the few available Brazilian specimens included both *aperea* and what we now know to be the quite distinct species *fulgida*. As a matter of fact, *guianæ* has practically the same colour as the real *aperea*, but is distinguished by its smaller size, the largest of three full-grown shells only measuring 63 mm. in length*, with length of bulla† 11·8 mm. and upper tooth-row 14. The skull is proportionately rather broadly built, with unusually developed postorbital projecting ledges.

Specimens are in the British Museum from the Kannuku Mountains, Berbice, and the Moon Mountains, all in British Guiana.

Putting aside the *Cavia porcellus* of Linnæus, based on the *Cavia cobaya* of Marcgrave, the domesticated guinea-pig, to which the name should be restricted, we next have

Cavia aperea, Erxl.

Cavia aperea, Erxl. Mamm. p. 348 (1777) (based on the "*Aperea*" of Marcgrave, Bras. p. 223, 1648).

Anæma hilaria, Geoff. N. H. Mamm. (fol.) ii. text to pl. 282 (1820).

Cavia leucopygia, Brandt, Mem. Ac. Petersb. 1835, p. 436, pl. xvi.

Size largest of the genus. General colour grizzled brownish grey, not the clearer or more olivaceous grey of the Argentine forms. Below dull whitish or drabby whitish, a clear white spot generally present on the middle line of the chest just behind the brown collar.

The largest of the available skulls measures no less than 73 mm. in total length, while the average of half a dozen from Minas Geraes and São Paulo is 68·7 mm. in total length, bulla 11·9, tooth-row 15·5. The hind foot in adults varies from 45 to 50 mm.

* The skull-length is here always taken from the tip of the nasals, and may sometimes be slightly exceeded by a slanting length from occipital to gnathion.

† Measured from the notch in front of the paroccipital process directly forwards, parallel with the axis of the skull, not to the antero-internal angle, which ends in an irregular point.

Range from Pernambuco to São Paulo; inland to Minas Geraes. Specimens in Museum from Bahia (*Zoological Society*); Rio Jordao, Minas Geraes (*Robert*); Alambary and Ypanema, São Paulo (*Robert*); and Victoria, São Paulo (*Hempel*). Recorded by Lund from Lagoa Santa.

The Paraguayan cavy is so similar to *C. aperea* that I should probably not have distinguished it, but, as it has a name, it may provisionally stand as

Cavia aperea azarae.

Cavia azarae, Wagn., Schr. Säug., Supp. iv. p. 63, footnote (1843).

Colour, as represented by fresh skins, very much as in true *aperea* or rather more olivaceous; size averaging slightly less, though individual specimens overlap. Averages of four skulls in greatest length 65·8 mm.; bulla 12·4; tooth-row 14·9. The bullae would, therefore, appear to be rather larger, but the number of specimens is not enough to indicate this with certainty.

Hab. Paraguay. Several specimens from Sapucay (*W. Foster*).

Next southwards from *C. aperea*, in the province of Parana, a special form was discovered by M. Robert, which may be described as follows:—

Cavia rosida, sp. n.

Size less than in *C. aperea*, greatest length of skull about 62 mm. General colour saturate, comparatively dark, nearly as much so as in *C. fulvida*. Upper surface grizzled "mummy-brown"; median area of back heavily blackened with long blackish piles, especially posteriorly, the middle of the lumbar region being nearly black. The blackening is, however, variable and occasionally almost absent. Under surface dull cinnamon-buff, the hairs pale grey basally; usual throat-markings scarcely distinguishable, the interramia buffy, the usual dark collar overlaid with dull buffy, and the white chest-patch either absent or reduced to a small spot. Inner side of limbs like belly.

Skull, as compared with that of *C. aperea*, smaller and with conspicuously shorter and slenderer muzzle—in fact, the skull, apart from the muzzle, is scarcely or not smaller than that of *aperea*, the difference in the whole length being almost entirely due to the reduction of the rostrum. Post-orbital projections not heavily developed. Bullae fairly large.

Dimensions of the type:—

Head and body 395 mm.; hind foot 46; ear 20.

Skull: greatest upper length 62; condylo-incisive length 58; zygomatic breadth 35; nasals 19.7×8.5 ; interorbital breadth 12.6; breadth of parietals across brain-case 24.5; diastema 17.4; bullæ 12.2×9.3 ; upper tooth-series 14.6.

Hab. Serra do Mar, Eastern Parana. Type from Roça Nova. Alt. 1000 m.

Type. Adult female. B.M. no. 3.7.1.96. Original number 831. Collected 6th September, 1901, by Alphonse Robert. Six specimens.

This cavy of the Serra do Mar is readily distinguishable from *C. aperea* by its dark colour, blackish back, buffy belly, reduced chest-markings, and by the short and slender muzzle of its skull. In the lowlands of the same region, at Morretes (10 m.), M. Robert found a representative of the *C. fulgida* group.

Next comes the well-known quiso of the Argentine and Uruguay:—

Cavia pamparum, Thos.

Cavia rufescens pamparum, Thos. Ann. & Mag. Nat. Hist. (7) viii. p. 538 (1901).

Allied to *C. aperea*, but smaller; the skull usually about 62–63 mm. in length when adult. Colour as in *aperea*, but distinctly more greyish or olivaceous, less brown. Under surface whitish or slightly drabby, the chest-pattern well marked.

Skull shaped as in *aperea*, but smaller; the muzzle of the same general proportion, not reduced as in *C. rosida*.

Range from Corrientes and Uruguay southwards to Southern Buenos Ayres. Specimens in Museum from “20 miles north of Corrientes” (*Turner Henderson*); Goya, Corrientes (*R. Perrens*); Maldonado (*Darwin*); La Plata (*Thomas*); Los Yngleses, Ajó, Buenos Ayres (*E. Gibson*); and Bonifacio, S.W. Buenos Ayres (*R. Kemp*).

All the specimens from the above considerable range agree very closely with each other in size and colour, no geographical variation being observable. Two of Mr. Gibson's Ajó specimens, however, out of seven are abnormally larger than the others, with decidedly larger skulls; but these appear more or less diseased, and it is possible that they represent an infusion of domestic guinea-pig blood, although there is no colour indication of this. The other specimens of the same lot are quite like the ordinary quiso. The size of the bulla is a little variable, two of the Bonifacio series having this 12.1 and 11 mm. in length, that of the type being 11.7.

Passing now to the cavyes of the Andean countries, Peru and Bolivia, we have first to identify *Cavia cutleri*, Bennett, the earliest name connected with that region.

The type-specimen, with imperfect skull, is in the British Museum—no. 53. 8. 29. 2,—and I have carefully examined it and compared it with the other material in the collection. It is a melano, and on this account its colour has never been able to be used for purposes of identification, while, although called a "Peruvian cavy," its original locality has always been doubtful.

The conclusion I come to is that it is a domesticated guinea-pig—*Cavia porcellus*, L.,—its skull being too large for any Peruvian wild species, while it is closely matched by examples of *C. porcellus*, among which, of course, black specimens are by no means infrequent.

With this troublesome name removed, the ordinary Peruvian cavy should bear the name of

Cavia tschudii, Fitz.

Cavia cutleri, Tschudi, Fauna Peruana, p. 195 (1845).

Cavia tschudii, Fitzinger, SB. Ak. Wien, lvi. pt. i. p. 154 (98 in separates) (1867).

with type-locality Ica, on the coast, where Tschudi saw the specimens he described.

The species is comparatively small, the skull about 58 to 62 mm. in length, and with small bullæ. In colour it is coarsely grizzled cinnamon, buffy or greyish, and the under-side varies from strongly buffy to nearly white.

These variations appear to indicate four subspecies, as follows:—

Cavia tschudii atahualpæ, Osgood.

Cavia atahualpæ, Osgood, Field Mus. Publ. x. p. 98 (1913).

Size fairly large, the bullæ larger than in the more southern forms. Colour dark, "evenly grizzled cinnamon and blackish, the bases of the hairs dark drab followed by two or more annulations of cinnamon and blackish"; back, and especially rump, with numerous longer black hairs; under surface more or less cinnamon or buffy. Length of type-skull 60 mm.

Hab. N. Peru: Cajamarca.

No Peruvian cavyes that I have seen have more than one light annulation on the hairs; but, even if there is no mistake in the observation, I should not consider it sufficient reason

to distinguish the North-Peruvian cavy specifically from *C. tschudii*, in view of its general agreement in size and other characters.

Cavia tschudii umbrata, subsp. n.

Size as in *atahualpæ*. Colour greyer throughout, the light rings on the hairs whitish instead of cinnamon or buffy.

Median area of back blackish, the darkening being effected not by overlaying with long black hairs, as in *atahualpæ* and *rosida*, but by the reduction of the light rings on the hairs, these being often barely 1 mm. in length, while those in the other subspecies are about 2–4 mm. as is usual. Bases of hairs pale slaty. Under surface soiled drabby, the belly and submaxillary lines of this colour; collar and middle line of chin greyish brown. Hands and feet pale brown, lighter on digits.

Skull of average proportions, the bullæ longer than in the two following subspecies.

Dimensions of the type:—

Hind foot 42 mm.; ear 20.

Skull: greatest length 60; condylo-incisive length 58; greatest breadth 57·7; nasals 20·5 × 8; diastema 18·2; bulla 11·8 × 9; upper tooth-series 13.

Hab. Junin, Central Peru. Type from Incapirca, Zezioro.

Type. Adult female. B.M. no. 94. 8. 6. 23. Collected 20th June, 1890, by J. Kalinowski.

This Junin subspecies agrees with *atahualpæ* by its darkened back, rather larger size, and larger bullæ, as compared with the two more southern forms that follow. From *atahualpæ* it differs in general colour very much as *pamparam* differs from *aperea*, and also in the details of the dorsal darkening.

Cavia tschudii tschudii, Fitz.

General colour fairly dark, strongly grizzled, the light rings on the hairs buffy or cinnamon. Under surface more or less strongly buffy. Median area of back not darkened.

Skull-length about 59–61 mm.; bullæ rather smaller than in the previous subspecies, 10·1–10·9 mm. in length.

Range. Middle Peru, from Iça to Cuzco.

The type-locality is Iça, and a specimen from Tambo, on the coast opposite Arequipa, agrees so precisely with the description as to be undoubtedly the same form. Four specimens from Urubamba, Cuzco, collected by O. Garlepp, agree absolutely with that from Tambo, while three from La Raya Pass, collected recently by E. Heller, are rather

greyer and more or less intermediate between this subspecies and the next; they are, however, all immature.

Cavia tschudii pallidior, subsp. n.

Similar in general characters to *tschudii*, but colour much lighter, the pale rings on the hairs a paler buffy, and the under surface a pale creamy buff approaching whitish. Collar a paler grey. Hands and feet buffy whitish, a little browner proximally.

Skull as in *tschudii*.

Dimensions of the type (measured in flesh):—

Head and body 242 mm.; hind foot 24; ear 29.

Skull: greatest length 59.5; condylo-incisive length 51; zygomatic breadth 33.5; nasals 20.3×8.7 ; diastema 16.6; bulla 10.2×8 ; upper tooth-row 14.

Hab. Arequipa. Type from 2500 m.

Type. Adult male. B.M. no. 0. 10. 1. 85. Original number 1023. Collected 31st May, 1900, by P. O. Simons. Presented by Oldfield Thomas. Six specimens.

Distinguished from *tschudii* by its lighter coloration throughout.

Cavia nana, sp. n.

A pigmy cavy, conspicuously smaller than any other species of the group.

Size very small, skull-length only about 52 mm. Colour about as in *C. tschudii pallidior*, the light rings on the hairs buffy or pale cinnamon; no darkening along the median area of the back. Under surface creamy whitish, the grey collar well marked. Hands and feet pale brown.

Skull about as in *C. tschudii*, but conspicuously smaller. Bullae especially small.

Dimensions of the type (measured in flesh):—

Head and body 215 mm.; hind foot 38; ear 23.

Skull: greatest upper length 52; condylo-incisive length 47; greatest breadth 29.5; nasals 17.5×7.5 ; interorbital breadth 10.5; breadth of brain-case 22; diastema 13.7; bulla 9.5×7.5 ; upper molar series, crowns 11.8, alveoli 12.5.

Hab. Highlands of Bolivia. Type from Chulumani, Yungas, 2000 m. Another specimen from the Desaguadero River (*J. B. Pentland*).

Type. Adult female. B.M. no. 1. 6. 7. 59. Original number 1363. Collected 16th February, 1901, by Perry O. Simons. Presented by Oldfield Thomas. Four specimens in all.

This remarkable little cavy furnishes a good example of the difficulty of distinguishing young specimens from old in this group; for, in spite of the fairly close survey of the collection always kept up, no one has previously noted that Mr. Pentland's specimen, received sixty-six years ago, is fully adult, and it is only on the general examination of the group now made that I have found this out, and am able to give Mr. Pentland the credit for a very interesting discovery. The first scientific explorer of the Titicaca plateau, he sent home quite a number of interesting specimens, but, of course, had not been instructed as to the proper preservation of data. On this account I have chosen one of Mr. Simons's three specimens as the type. These were erroneously called *C. aperea* in my account of the latter's Bolivian collection.

In proof that the specimens are full grown, I may note that the type has its basilar suture closed, while Mr. Pentland's specimen has already the bell-tale sagittal crest characteristic of old individuals.

Lastly, we have the Brazilian species with the deep notch on the outer side of m^3 already referred to. There appears to be only one species of this group, whose name and characters are as follows:—

Cavia fulgida, Wagler.

Cavia fulgida, Wagler, Isis, xxiv. p. 512 (1831); *Wagn., Schr. Säug., Supp. iv. p. 59 (1843) (redescription of type).

Cavia rufescens, Lund, K. Dansk. Vid. Selsk. viii. p. 282 (1841).

Cavia nigricans and "*Kerodon obscurus*, Licht.," Wagn., Schr. Säug., Supp. iv. p. 64 (1843).

Size comparatively small, greatest skull-length rarely attaining 60 mm. Colour rich dark grizzled brown; under surface deep buffy or ochraceous, dulled by the greyish bases of the hairs showing through to a variable extent.

Last upper molar with a deep indentation on its outer side at the anterior end of the posterior lobe.

Range from Lagoa Santa, Minas Geraes, to Santa Catharina; type said to have been obtained on the "Amazonian" journey of Spix*, but the species is not known to occur on the Amazon.

* Spix's other explorations were mostly in the region inhabited by the species I now call *C. fulgida*, and some error probably crept in as to the particular trip on which it was collected. Or, with the loose geography of the time, all his Brazilian journeyings may have been spoken of as "Amazonian." Wagner expressed certainty as to the identity of *fulgida* and *rufescens*, and there appears to me no doubt about it.

Specimens in Museum from Minas Geraes (Zool. Soc. Museum); Eugênio Reeve, Espírito Santo (*A. Robert*); Rio Janeiro (*Capt. Milner* and *L. Hardy du Dreneuf*); Cruzeiro and Piqueté, São Paulo (*Robert*); Moretes, Paraná (*Robert*); Humboldt (*Ehrhardt*) and Joinville (*Behr*), Santa Catharina.

A very distinct species, readily recognizable by its peculiar *m*². In colour it is not unlike *Cavia rosida*, but has not the special darkening on the back.

BIBLIOGRAPHICAL NOTICE.

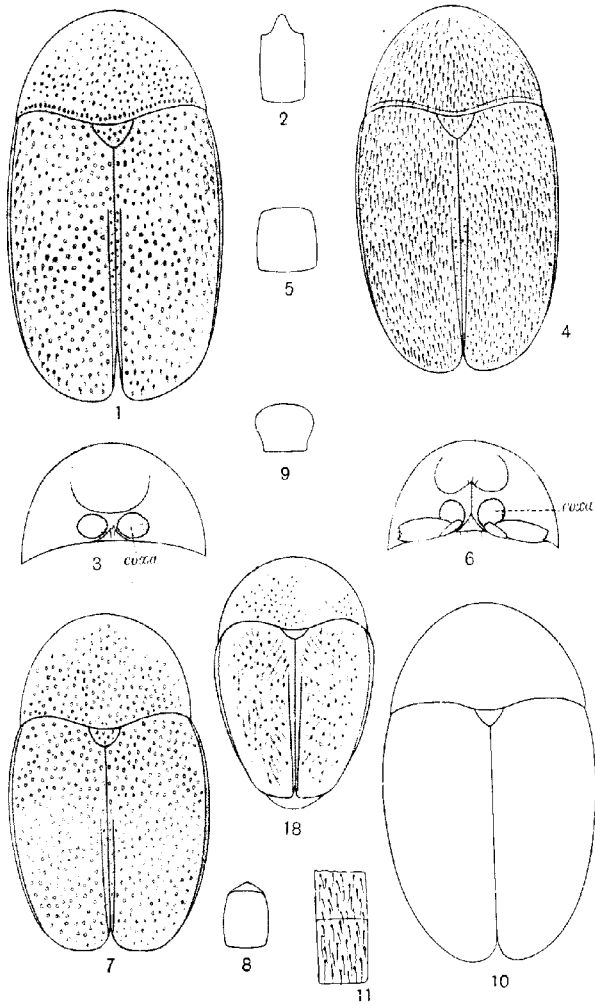
African Freshwater Fishes.

WITH the completion of vol. iv. of the 'Catalogue of Freshwater Fishes of Africa' (London, the Trustees of the British Museum, 1916) Mr. G. A. Boulenger has earned the gratitude, not merely of students of African fishes or of ichthyologists in general, but of all who are concerned with the problems of geographical distribution.

In these four volumes Mr. Boulenger has described the largest collection of freshwater fishes ever brought together from one area in any part of the world, comprising as it does over 15,000 specimens now in the British Museum and an almost equal number in the museums of the Nile Survey, the Congo (Tervuren), S. Africa, Paris, and Luxemburg.

How immensely our knowledge of the freshwater fishes of Africa has grown during the last thirty years or so may be gathered from the fact that in 1880 only 255 species were known. Ten years ago this number had increased to 974. In the present catalogue no less than 1425 species are described, and this increase is largely due to the zeal and enthusiasm of the author of this catalogue, of which he may well be proud.

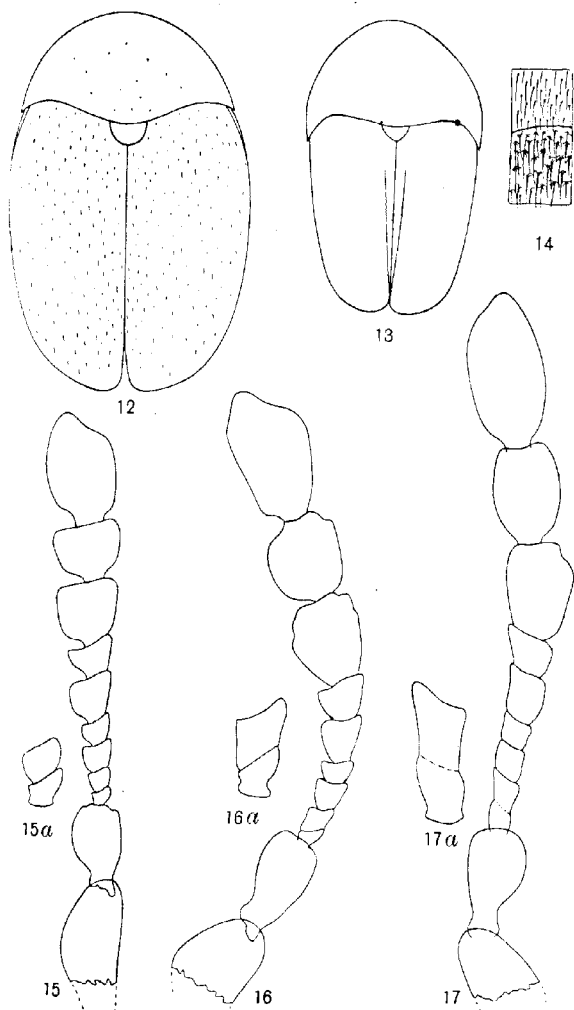
Though it would materially have increased the bulk of these volumes, we venture to think that their value would have been immensely increased by the addition of internal anatomical characters—or, at any rate, of skeletal characters—and field-notes contributed by the collectors. But there were probably good reasons for reducing the work to the smallest possible dimensions. Happily it is well illustrated and has a good index.



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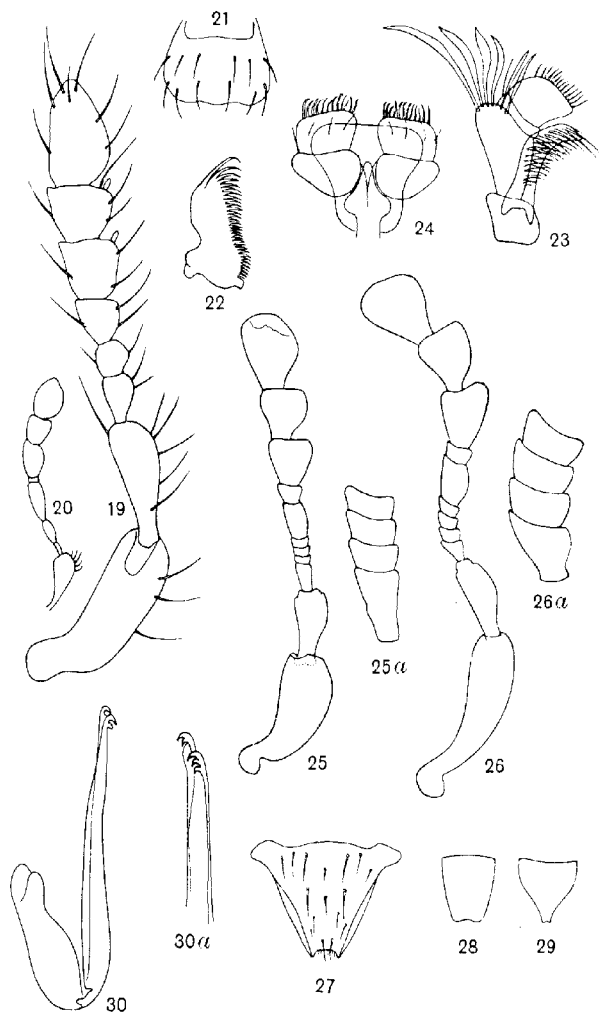
CORYLOPHID BEETLES



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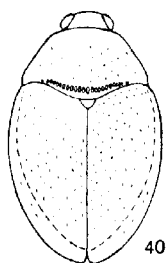
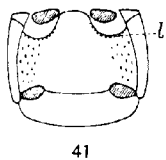
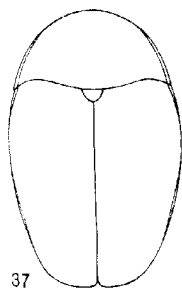
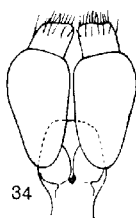
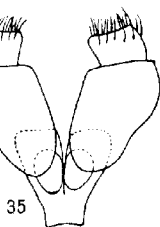
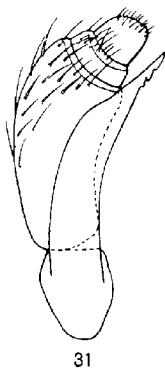
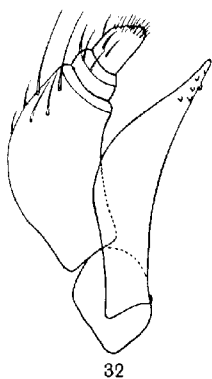
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CONT.

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